

WESTERN AREA POWER ADMINISTRATION

**INTEGRATED VEGETATION MANAGEMENT
ENVIRONMENTAL GUIDANCE MANUAL**

SEPTEMBER 1999

Instructions For Using This Manual

The Integrated Vegetation Management manual is a broad compilation of information written specifically for the vegetation management needs of Western Area Power Administration. This document presents Western Area Power Administration's vegetation management program. The users of this document must recognize that this is a living document. This document should be looked upon as a working manual with revisions or additional information noted for inclusion in future updates. Revisions are to be expected as regulations change, and as the manual is put into Westernwide use.

As noted in the introduction which follows, this manual addresses both the control of unwanted vegetation, including the control of noxious weeds, and the revegetation of disturbed areas. Western's vegetation management program follows the principles of integrated vegetation management where several methods of vegetation control are considered, including mechanical, biological, and chemical control methods.

The Integrated Vegetation Management manual can serve as a supporting document for training of individuals involved with vegetation management either for bare ground control at substations/maintenance yards and/or those land areas under transmission lines requiring spot treatment or danger tree management. This manual is intended to provide you with information needed to meet the standards of the U.S. Environmental Protection Agency for commercial certification as a pesticide applicator in the category Right-of-Way Pest Control. However, this manual should not be considered an all-inclusive document. Up-to-date information regarding recommended materials and methods should be obtained from your State pesticide regulatory agency or the pesticide label. In addition, the users of this document must rely upon their knowledge of historic and current facility vegetation management methods and their professional judgement to determine the applicability of each vegetation management method or procedure.

It is hoped that the manual will provide users with useful information for managing vegetation and provide for the safe and correct application of chemicals (herbicides) to control vegetation around Western facilities. The information given in this manual is supplied with the understanding that no endorsement is implied or discrimination intended.

Please send recommended manual changes, additions, and/or revisions, as well as general comments to Art Roybal, Vegetation Management Program Manager, Corporate Services Office, Environment, 1627 Cole Boulevard, Golden, CO 80401.

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1.1 BACKGROUND AND DOCUMENT ORGANIZATION

This document presents information on the Integrated Vegetation Management Program (IVMP) for transmission facilities in Western Area Power Administration's (Western's) 15-state service area. Western operates and maintains more than 17,000 miles of transmission lines, more than 260 substations, and other electrical facilities. The underlying need for the IVMP is to ensure reliable and cost-effective operation of Western's Federal transmission system, while protecting the environment and the safety and health of Western employees and the general public.

Western's IVMP addresses both the control of unwanted vegetation and the control of noxious weeds. It also includes information about reestablishment of vegetation on disturbed areas (reclamation). Western's IVMP follows the principles of Integrated Vegetation Management (IVM), which promotes the use of several methods as one management system to control unwanted vegetation. Therefore, Western's program includes a number of options for vegetation control, including cultural/natural control, physical/mechanical control, biological control, and chemical control.

This document is organized in the following manner:

Section 1.0 - Background, Objectives, and Policies

Section 2.0 - References - includes summaries of Federal and State regulatory requirements and interagency agreement information

Section 3.0 - Definitions and Terminology

Section 4.0 - Selection of a Vegetation Management Method

Section 5.0 - Biological Control Methods

Section 6.0 - Physical/Mechanical Control Methods

Section 7.0 - Chemical Control Methods

Section 8.0 - Western's Environmental Protection Standards

Section 9.0 - Monitoring

Section 10.0 - Conductor Clearing Requirements

Section 11.0 - Noxious Weed Management

Section 12.0 - Revegetation/Reclamation

Section 13.0 - New Vegetation Control Methods: Tree Growth Regulators and Biobarriers

Appendixes - include brief summaries of regulatory requirements for pesticide use and noxious weeds in a State-by-State format, example cooperative and interagency agreements, and other materials referenced throughout the text.

1.2 OBJECTIVES

The specific objectives of Western's IVMP all relate to the underlying need to ensure reliable operation of the Federal transmission system. Specific management objectives include:

Prevent operation hazards

In forested areas, Western controls tall-growing trees on transmission line rights-of-way so they do not grow into contact with the conductors, thereby causing short circuits and outages. Trees adjacent to transmission lines may present a danger of falling into the lines due to wind, leaning, decay, or other causes of instability. Such unstable, hazardous trees, called danger trees, must be removed. Microwave beam paths must also be managed so that tall-growing trees do not interfere with or block microwave signals that are essential in monitoring and controlling the system.

Provide Access for Maintenance and Repair

It is essential that Western have access to its transmission facilities. System reliability criteria require unimpaired access to rights-of-way and transmission structures for routine inspection and maintenance, and emergency repairs. Access roads, especially when not heavily used, can become overgrown with vegetation and become impassible or dangerous. Access roads are therefore managed to keep them clear of vegetation. Similarly, areas around transmission structures are kept free of trees, shrubs, and poisonous plants to allow safe working space for crews during routine maintenance and emergency repairs.

Protect Facilities from Fire

Within substations, switchyards, and microwave stations, vegetation is managed to minimize the possibility of electrical short circuits and fire. Removal of ground vegetation in these areas (and prevention or control of its regrowth) reduces the potential for safety hazards to workers, damage to equipment, and outages.

In certain range land areas, transmission lines carried by wood pole structures are susceptible to damage by rapidly spreading ground fires. These fires can burn away the bases of transmission structures, causing them to fall. In these situations, vegetation is cleared from around the bases of the structures to prevent them from being ignited by ground fires.

Control the Spread of Noxious Weeds

Noxious weeds pose a serious threat to the continued economic and environmental value of the lands of the western U.S. The control of noxious weed infestations is a requirement on private and public land in every state in Western's service area. Therefore, Western's IVMP will be expanded to include control of noxious weeds on fee-owned land and selected rights-of-way.

While satisfying the underlying need, Western's IVMP will also aim to achieve a number of additional objectives:

Protect Public and Worker Safety

To design and implement a IVMP that will minimize health and safety hazards to maintenance workers and the public.

Develop Technical and Economic Efficient Program

To develop a program that will manage vegetation in a manner that is technically effective and economically efficient.

Protect Environmental Quality

To plan and implement the IVMP in such a manner that environmental quality is protected. Specifically, certain attributes of environmental quality such as water quality, wildlife habitat diversity, and visual quality will be considered in planning and implementing the IVMP. The program will aim to safeguard aesthetic and environmental values within the constraints imposed by high-voltage transmission line construction and maintenance.

Establishment of Stable, Low-growing Plant Communities on Transmission Line Rights-of-Way

To establish vegetation management methods that promote a stable, low-growing plant community on the right-of-way such as grasses and shrubs. This type of plant community would be compatible with transmission line facilities, serving as an environmentally acceptable and useful ground cover, and naturally retarding the regrowth of tall-growing vegetation. The frequency of future right-of-way maintenance operations and potential interruption of service would be reduced.

Adhere to Principles of IVM

IVM can be defined simply as a sustainable approach to managing vegetation by combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health, and environmental risks. IVM de-emphasizes the exclusive use of chemical control.

In keeping with the principles of IVM, it will be Western's policy to provide for integrated approaches to vegetation control. These various approaches, which are addressed in greater detail throughout this document, include:

Biological Control - introduction of natural insect predators; grazing

Physical/Mechanical Control - manual cutting; mowing

Chemical Control - herbicides

Also proposed for inclusion in Western's IVM policy is vegetation enhancement or establishment. This includes:

Reclamation/Revegetation - seeding, fertilizing, establishment of low-growing native vegetation and/or vegetation that is compatible with transmission line facilities.

This section provides information regarding certain reference materials essential to Western's IVMP. These references include **applicable State and Federal regulations** regarding pesticides and noxious weeds, plus **interagency agreements** and **cooperative agreements** that Western has negotiated with other land management agencies whose lands are crossed by Western's transmission facilities. **This section provides a brief overview of these references; details and example agreements can be found in Appendixes A, B, C, and D.** Appendixes A and B include State-by-State summaries of pesticide and noxious weed regulations, respectively. These appendixes identify those herbicides that are classified as "restricted" or "limited use" and those plants that are considered noxious weeds for all the States in Western's service area.

Most of the information provided here and in the appendixes is current as of September 1999. Because the nature of the regulatory environment is constantly changing discussions and communications with the regulatory agencies are essential to ensure compliance. The reader should also be aware that noxious weed regulation often falls to the county level, and therefore contact with the county regulatory agency should be made to check on additional or more stringent requirements.

2.1 FEDERAL REQUIREMENTS

The **National Environmental Policy Act** (NEPA) requires Federal agencies to consider the potential for significant impacts to the human and natural environment of their actions. The Council on Environmental Quality has published implementing regulations (40 CFR 1500-1508) and the Department of Energy has published implementing procedures (10 CFR 1021) that guides Western's compliance with the Act. Actions such as vegetation management can normally be categorically excluded as part of the routine maintenance exclusion (see Appendix B or Subpart D of 10 CFR 1021) as long as the action meets the integral elements of that exclusion. However, other land-managing agencies may have other requirements when the actions are taken on their lands.

The **Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)** regulates the manufacture, use, storage and disposal of chemicals used as pesticides as described in 40 CFR Parts 150-180. The focus of FIFRA is on pesticide producers; however, this section will emphasize the parts of the regulation applicable to the use, storage and disposal of pesticides. The key points of FIFRA are as follows:

- Regulates all pesticides including herbicides, insecticides, fungicides, and plant growth regulators.
- Regulates all pesticide labels and packaging.
- Classifies pesticides as unclassified, general use or restricted use (40 CFR Part 152, Subpart I). Restricted use may prescribe restrictions relating to the products, composition, labeling, packaging, uses, or the status or qualifications of the user.
- Describes the written records that certified applicators need to keep.
- May give fines of up to \$25,000 and jail sentences of up to one year for misapplication of pesticides and violation of FIFRA standards.
- Provides for the registration of pesticides or the cancellation of a registration.
- Provides work protection standards.

Users of restricted use pesticides should particularly note the following regulations:

- Disposal and Storage of Pesticides (40 CFR Part 165) - specifies the regulations and procedures for the disposal or storage of pesticides, pesticide containers, and pesticide-related wastes, and for the acceptance for safe disposal by EPA of pesticides whose registration has been canceled.

- Certification of Pesticide Applicators (40 CFR Part 171) - outlines the requirements for applicators of restricted use pesticides. Includes the categorization of commercial and private applicators, standards for certification of commercial and private applicators, and supervision of noncertified applicators.

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA):

- Regulates methods of cleaning up recent and past spills of hazardous substances.
- Defines time period within which EPA and other agencies must be notified of current spills of hazardous substances.
- Uses reportable quantities (RQs) of hazardous substances to decide when Federal and State agencies are notified of spills.
- CERCLA and the National Contingency Plan specify Federal Natural Resource Trustees. DOE is a designated trustee for natural resources that are on, over, or under land under its jurisdiction and not specifically the responsibility of some other resource management agency.

Federal facilities that have released hazardous substances should, therefore, clearly be concerned about natural resource damage liabilities. In other words, DOE may have a dual role; where DOE activities have resulted in hazardous substance releases, DOE is the CERCLA Lead Response Agency and as such may be subject to natural resource liabilities to other trustees; but DOE is also the trustee for the natural resources under its own jurisdiction.

The Superfund Amendments and Reauthorization Act of 1986 (SARA Title III), also known as the Emergency Planning and Community Right-To-Know Act (EPCRA):

- Sets up State emergency response commissions and local emergency planning committees.
- Requires industrial facilities to provide written plans to describe what they would do in the event of a "chemical emergency".
- Requires an annual inventory of all chemicals on site when certain amounts are exceeded.
- Must provide the State emergency response commissions, local emergency planning, and the local fire department with names and quantities of hazardous substances stored.

The Federal Occupational Safety and Health Administration (OSHA):

- Protects worker health and safety.

OSHA's Hazard Communication Standard:

- Requires workers be provided with a Material Safety Data Sheet (MSDS) for all hazardous materials including pesticides.
- Trains workers on the hazards of the materials handled.
- Provides information to workers on how to protect themselves and what to do during emergencies such as spills and fires.

The Department of Transportation (DOT):

- The Federal DOT regulates the shipping of pesticides and other hazardous materials.

HMTA, the Hazardous Materials Transportation Act, requires:

- Placards and shipping papers for shipping certain quantities of hazardous materials.
- Reporting of transportation accidents involving hazardous chemicals.
- Training of commercial drivers and workers who unload hazardous chemicals.

State OSHA, EPA, Agricultural agencies and local Health and Weed Control Agencies may also have specific regulations which deal with pesticide use, spills, transportation and disposal.

The Federal Noxious Weed Act of 1974:

- Defines a noxious weed as any living stage of a plant that can directly or indirectly injure crops, other useful plants, livestock, or poultry or other interests of agriculture including irrigation, or navigation or the fish and wildlife resources of the United States or the public health.
- Regulates the sale, purchase, and transportation of noxious weeds into or through the United States.
- Regulates the inspection and quarantine of areas suspected of infestation and provides for the disposal or destruction of infested products, articles, means of conveyance, or noxious weeds.
- May give fines of up to \$5,000 and/or imprisonment up to 1 year for violation of the regulation.

- Requires Federal agencies to work with State and local agencies to develop and implement noxious weed management programs on Federal lands.

The Endangered Species Act:

- Protects listed plants and animals that are threatened by habitat destruction, pollution, overharvesting, disease, predation, or other natural or man-made factors.
- Stipulates that listed species cannot be possessed, taken, or transported without special permission. All Federal agencies must ensure that their activities do not jeopardize a listed species or its critical habitat.
- Provides for review of pesticide formulations and their application methods and rates to determine if pesticide use may have potential adverse effects on listed species or their critical habitats.
- Note: There are pamphlets available for certain counties that restrict the use of pesticides in the habitat or area of occurrence of listed species.

Presidential Memorandum Dated April 26, 1994 for the Heads of Executive Departments and Agencies and Guidance for This Memorandum From the Office of the Federal Environmental Executive (August 10, 1995; 60 FR 40837): In this memo and the accompanying guidance, agencies are directed to:

- use regionally native plants for landscaping;
- design, use, or promote construction practices that minimize adverse effects on natural habitat;
- seek to prevent pollution by, among other things, reducing fertilizer and pesticide use, using integrated pest management techniques, recycling green waste and minimizing runoff . . . ;

- implement water efficient practices, such as use of mulches, efficient irrigation systems, audits to determine water-use needs, and siting of plants in a manner that conserves water and controls soil erosion. Landscaping practices, such as planting regionally native shade trees . . . to reduce air conditioning demands . . . ;
- create outdoor demonstrations incorporating native plants, as well as pollution prevention and water conservation techniques . . . "

A **DOE memorandum dated November 3, 1997** from the DOE Office of NEPA Policy and Assistance emphasized the need to consider environmentally and economically beneficial landscape practices and the above guidance when developing NEPA documents.

2.2 STATE PESTICIDE REGULATIONS AND REQUIREMENTS

Western will comply not only with all Federal regulations regarding pesticides, but also State regulations. These regulations include:

- Pesticide applicator certification
- Applicator Recordkeeping requirements
- Pesticide spill and disposal requirements
- Bulk storage of pesticides
- Notification requirements

All 15 States in Western's service area have primacy for regulating the use, storage and disposal of pesticides.

Pesticide regulations vary from State to State (see Appendix A, State Pesticide Regulations); however, general guidelines applicable to pesticide applicators are discussed below.

Pesticide Applicator Certification

All States require a pesticide applicator to be certified or licensed. To qualify, a person must pass an EPA-approved examination that tests the knowledge and

understanding of Federal, State, and local pesticide regulations; terminology; safety; types of pesticides; environmental consequences; and other categories as required. An annual fee is required for a license, and continuing education is generally necessary for recertification.

Applicator Recordkeeping Requirements

All States require, at a minimum, that the following information be kept on file for two or more years. These records must be maintained for each application of any restricted use or limited use pesticides, or any pesticides applied by a commercial applicator.

- Name and address of person who made application
- Location where application was made
- Target pest
- Specific pesticide applied
- Application rate
- Date and time of application

Pesticide Spill and Disposal Requirements

Most States have a generalized regulation stating that no person may dispose of surplus pesticides, empty pesticide containers and devices, or pesticide rinsate in such a manner as to endanger the environment, humans, vegetation, crops, livestock, wildlife, or beneficial insects; or pollute any waterway. Some States (e.g., North Dakota) have empty container repositories. For the location of these facilities, contact the State hazardous waste department.

Bulk Storage of pesticides

Most States require that pesticide concentrates and dilute mixtures be stored in a way that will prevent contamination of other products by means of volatilization, leakage, or breakage, which can create a risk to humans, property, domestic or wild animals, or the environment. This includes keeping storage areas clean and orderly, limiting access to storage areas, placing hazardous materials warning signs on storage areas,

providing pertinent information to the local fire department, and keeping fire extinguishers and materials for cleaning up spills on site.

Many States now require secondary containment measures and mixing and loading pads for bulk storage of pesticides. Bulk storage generally refers to quantities greater than 55-300 gallons of concentrate or 100-200 pounds of dry material.

Notification Requirements

Three States (Iowa, Minnesota and Nevada) require any applicator making a pesticide application in a city or developed residential area to notify the public of the application by posting at least one sign, of a specified size, at each place of legal public entry. Several other States allow for promulgation of similar rules.

Details of individual State requirements can be found in Appendix A.

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| <p>NOTE: In addition to State pesticide regulations, States may have other laws, such as water quality, water use, and hazardous waste regulations, that regulate the storage, use, and disposal of pesticides.</p> |
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The EPA has requested that States develop a generic State management plan for groundwater protection. This plan will serve as a template for development of pesticide specific management plans (PSMP) for those pesticides where monitoring results identify particular chemicals or locations with degraded water quality due to the use of pesticides. A few States have completed their generic plans, and most expect them to be completed soon. It will then take at least 1 to 2 years before monitoring results are obtained and chemical specific regulations are enacted.

2.3 STATE WEED CONTROL REGULATIONS AND REQUIREMENTS

A noxious weed is any species of plant that is, or is liable to be, troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture, or important native species, public roads or other property; and is difficult to control or eradicate.

Most of the States in the Western service area have regulations for the management or control of noxious weeds. Texas does not have noxious weed regulations; therefore, noxious weeds are managed under the Federal Noxious Weed Act of 1974 (7 CFR 360).

In general, a State or any part of a State may be quarantined to prevent the introduction, spread, or dissemination of any noxious weeds as defined in the regulations. In addition, most States require landowners to eradicate or control any noxious weeds and enforce penalties or fines on landowners for failure to do so. **(See Appendix B for State noxious weed regulatory summaries, including State lists.)**

Many counties also have noxious weed lists that may include additional species that must be controlled. **Individual County Weed Control Boards or Commissions should be contacted to obtain a complete list of weeds considered noxious for that county.**

2.4 INTERAGENCY AGREEMENTS/COORDINATION

Because Western's facilities may be located on, near, or across tribal lands or lands owned by other Federal or State land management agencies, it is important to coordinate IVMP activities with these agencies and to honor any provisions in Interagency Agreements unless the provisions are renegotiated. These agreements may have specific restrictions on herbicide use and types of clearing, e.g., they may call for only topping/trimming of trees in more sensitive environmental or visual areas. Tribal governments are requiring coordination with their natural resource office prior to applying pesticides on tribal lands. **Appendix C provides an example Interagency Agreement that may be followed when initiating a new agreement or revising an existing one.**

Interagency or cooperative agreements are also done with land management agencies and counties to spell out responsibilities and required coordination regarding control of noxious weeds (see Section 10.5). The Colorado River Storage Project office initiated discussions with a number of Forest Service District Offices and counties on the Western Slope of Colorado. It is Western's intent to develop interagency agreements with the Forest Service, and cooperative agreements with the counties, where necessary.

In addition, Western will seek coordination with the other Federal land management agencies, such as the Bureau of Land Management (BLM) and the U.S. Forest Service (USFS), to provide for noxious weed management on Western's rights-of-way on Federal lands. Agreements are in place with the U.S. Forest Service, San Juan-Rio Grande and Gunnison-Uncompahgre-Grand Mesa National Forests. The success of these initial agreements will determine the need and extent of the development of like agreements in other States.

In Colorado, cooperative agreements were developed with the Eastern Montrose County and Gunnison County Weed Commissions. These agreements outline mutual responsibilities for management and control of certain noxious weed species within the county's area of jurisdiction. These cooperative agreements will be used as pilot efforts in the development of additional county weed management agreements throughout Western's service area. **Appendix D provides an example of a Western/County weed management cooperative agreement.**

2.5 WESTERN AREA POWER ADMINISTRATION ORDERS, MANUALS AND GUIDANCE

- WAPA ORDER 5400.1A, ENVIRONMENTAL CONSIDERATIONS IN THE PLANNING, DESIGN, CONSTRUCTION, AND MAINTENANCE OF POWER FACILITIES AND ACTIVITIES, of 11-10-94, describes environmental requirements that may be necessary to support maintenance activities.
- WAPA Power System Maintenance Manual, Chapter 11, Trimming and Felling of Trees and Brush Near Powerlines, April 1996.
- WAPA ORDER 6460.1, RIGHT-OF-WAY MANAGEMENT GUIDANCE FOR DANGER TREES, ENCROACHMENTS AND ACCESS ROUTES, of 3-1-95, delegates and clarifies responsibilities to the Maintenance Managers and establishes guidance and organizational support for maintenance and safe operation of WAPA rights-of-way.

DEFINITIONS AND TERMINOLOGY

| | |
|------------------------------|--|
| Absorption | Penetration of a substance from the surface to below the surface. |
| Active ingredient | The chemical compound in a product responsible for the desired effects, or the ingredient or ingredients which are capable in themselves, of preventing, destroying, repelling or mitigating insects, fungi, rodents, weeds, or other pests in the case of an economic poison. |
| Acute toxicity | A measure of the amount of a substance, as a single dosage or concentration, required to kill test animals of several species. |
| Adjuvant | Any substance in a herbicide spray mixture that enhances the effectiveness of the herbicide. (See Surfactant.) |
| Basal spray/treatment | A treatment applied to the stems or trunks of plants at or just above the ground line. |
| Biological control | The use of live organisms to control a pest species. |
| Biotypes | Naturally occurring individuals of species which have a slightly different genetic makeup. Resistant biotypes may look the same as susceptible biotypes. Herbicide-resistant biotypes are able to survive a use rate several times higher than needed to control susceptible biotypes. |
| Broadcast application | An application over an entire area. |

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| Broadleaf plants | Botanically classified as dicotyledons. Plants have two cotyledon leaves in the seedling stage; true leaves are mostly broad and have netlike or reticulate veins. |
| Brush control | Control of woody plants. |
| Buffer strip | A protective area adjacent to an area requiring special attention or protection. In contrast to riparian zones which are ecological units, buffer strips can be designed to meet varying management concerns. |
| Carrier | The liquid or solid material added to a chemical compound to facilitate its field application; an inert material which when used with a pesticide improves the physical dispersion of the pesticide. |
| Chemical name | A name that indicates the chemical composition and/or chemical structure of the compound being discussed. |
| Chronic toxicity | The results produced in test animals by long-term exposure to a dose or concentration estimated to approximate the exposure to be encountered through use of the test substance in a prescribed manner. |
| Contact herbicide | A herbicide that kills primarily by contact with plant tissue rather than as a result of translocation. |
| Cut surface application | Treatments applied to frills or girdles that have been made through the bark into the wood of a tree. |

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| Defoliant | A compound which causes the leaves or foliage to drop from the plant. |
| Degradation | The process by which a chemical is decomposed or broken down into less complex compounds or elements. |
| Desiccant | A compound that promotes dehydration or removal of moisture from plant tissues. |
| Directed application | An application to a restricted area such as a row, bed, or at the base of plants. |
| Dormant | State of inhibited growth of seeds or other plant organs. |
| Drift | The movement of air-borne particles from the intended contact area to other areas. |
| Dry flowable (DF) | A highly concentrated granule designed to break up and disperse in water in a manner similar to that of wettable powders. Requires agitation. |
| Dry soluble (DS) | A dry formulation that forms a solution when added to water. |
| Emulsifiable concentrate (EC) | A single-phase liquid system that forms an emulsion when mixed with water. Requires mild agitation to maintain the emulsion. |
| Emulsion | A mixture in which one liquid is suspended as minute globules in another liquid; e.g., oil/water emulsion. |

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| Ester | A compound formed by the reaction of an acid and an alcohol; a type of herbicide compound. |
| Foliage spray/application | Application of a herbicide to the leaves of plants. |
| Forbs | Herbaceous plants other than grasses or sedges; most often used pertaining to herbaceous plants eaten by wildlife. |
| Formulation | A term used synonymously with product. It contains the active pesticide, the carrier, and other additives required to make the pesticide ready for application. |
| Fumigant | Chemical used in the form of a volatile liquid or a gas to kill insects, nematodes, fungi, bacteria, seeds, roots, rhizomes, or entire plants; usually applied in an enclosure of some kind or in the soil with a plastic or water surface seal. |
| Granules | Low concentration (usually 5 to 15 percent active ingredient) designed to be spread dry. In the form of ready to use particles that are much larger than dust particles, which minimizes drift problems. |
| Growth regulator | An organic substance effective in very small amounts for modifying plant processes. |
| Groundwater | Subsurface water in the zone of saturation. The top surface of the groundwater is the "water table." |
| Half-life | The amount of time required for half of a compound to degrade. |

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| Herbaceous plant | A vascular plant that does not develop woody tissues. |
| Herbicide | A pesticide used for killing or inhibiting plant growth. |
| Inert ingredients | All ingredients which are not "active" (see Active ingredient). |
| Integrated Vegetation Management | A sustainable approach to managing vegetation by combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health, and environmental risks. |
| Label | All printed material on or attached to a pesticide container as required by law. |
| Leaching | Movement of a substance downward in solution through the soil. |
| Micro-encapsulation | A solid or liquid dispersed into very fine particles and surrounded by a polymer skin for slow release. |
| Mode of Action | The chemical interaction that interrupts a biological process necessary for plant growth and development. |
| Native Plant | A native plant is one that occurs naturally in a particular region, ecosystem and/or habitat without direct or indirect human actions. |
| Nonselective herbicide | A chemical that is generally toxic to all plants. |
| Nontarget component or vegetation | Vegetation which is not expected or planned to be affected by the treatment. |

Noxious weed

A weed defined by law as being especially undesirable, troublesome, and difficult to control. Definition of the term noxious weed varies according to legal interpretations. In most cases, noxious weeds are also nonnative species.

Pellet

A dry formulation of herbicide and other components in discrete particles usually larger than 10 cubic centimeters.

Pest

Each of the following forms of plant and animal life and viruses is declared to be a pest under the Federal Insecticide, Fungicide, and Rodenticide Act when it exists under circumstances that makes it injurious to plants, humans, domestic animals, other useful vertebrates, useful invertebrates, or other articles or substances: mammals; birds, fishes; amphibians, reptiles; aquatic and terrestrial invertebrates; roots and other plant parts growing where not wanted; and viruses other than those on or in living humans or other animals.

Pesticide

A chemical that kills or inhibits pests (plants or animals).

Phenoxy herbicides

Chemicals having herbicidal properties and a chemical structure consisting of a phenyl ring attached to an oxygen, which is in turn attached to a carboxylic group. Examples of phenoxy herbicides are 2,4-D, MCPA, 2,4,5-T, 2,4,5-TP (Silvex), 2,4-DB, Herbon, and Sesone.

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| Plant regulator | A substance intended to alter the behavior of ornamental crops or plants or the produce thereof through physiological rather than physical action. The term does not include substances intended solely for use as plant nutrients or fertilizers. |
| Postmergence | Applied after the specified weed or crop emerges. |
| Preemergence | Applied before the specified weed or crop emerges. |
| Rate | Rate refers to the amount of active ingredient or acid equivalent of a pesticide applied per unit area (such as one acre). Rate is preferred to the occasionally used terms dosage and application. |
| Registered | Pesticides that have been approved for use by the Environmental Protection Agency or states that conduct their own registration (e.g. California). |
| Resistant or tolerant | Not particularly susceptible to the action of a herbicide; weed resistance determines the rates of herbicide or herbicide choices required for control. |
| Restricted use pesticide | A pesticide that may only be used under certain conditions and may only be applied by certified applicators. |
| Selective pesticide | A chemical that is more toxic to some species (plant, insect, animal, microorganisms) than to others. |

| | |
|-------------------------|---|
| Slash | The residue left on the ground after timber cutting; can include unused logs, uprooted stumps, broken stems, branches, twigs, leaves, bark, and/or chips. |
| Soil application | Application of a chemical primarily to the soil surface rather than to vegetation. |
| Soil persistence | Length of time that a herbicide application on or in soil remains effective. |
| Soil sterilant | A chemical that prevents the growth of plants, microorganisms, etc., when present in soil. Soil sterilization may be temporary or relatively permanent, depending on the nature of the organism being controlled. |
| Spot treatment | The application of a pesticide to selected individual plants. |
| Spray drift | The movement of airborne spray particles from the intended application area. |
| Stump treatment | Application of herbicide to cut stumps and root collars, using a basal spray mixture or ready-to-use formulation. |
| Surfactant | A material which facilitates and accentuates the emulsifying, dispersing, spreading, wetting, and other surface-modifying properties of the formulations. |

| | |
|--------------------------------|--|
| Systemic pesticide | A term used to describe certain pesticides that function by entering and becoming distributed within the plant as opposed to the pesticides that function by contact with the plant's surface. Also called "Translocated pesticide." |
| Tackifier | A type of adjuvant added to the spray mixture to aid in herbicide adherence. |
| Tank-mix combination | Mixing of two or more pesticides or agricultural chemicals in a spray tank at application time. |
| Target species | Plant species that are not desirable because they may interface with line safety or operations and are therefore controlled in favor of desired species; often these are tall-growing species. |
| Toxicity | The capacity of a substance to produce injury. |
| Translocated pesticide | One that is moved within the plant from the site of entry (see Systemic). |
| Vapor drift | The movement of herbicidal vapors from the area of application. |
| Volatile | A compound is volatile if it evaporates at ordinary temperatures on exposure to air. |
| Water dispersed granule | See Dry Flowable. |
| Weed control | The process of limiting weed infestation so that crops can be grown profitably or other operations can be conducted efficiently. |

Weed eradication

The complete elimination of all live plants, plant parts, and seeds of a weed infestation from an area.

Wettable powder (WP)

A finely divided dry formulation that can be readily suspended in water. Requires agitation.

Wetting agent

Substance that reduces interfacial tensions and causes spray solutions or suspensions to make better contact with treated surfaces. (See Surfactant.)

SELECTION OF A VEGETATION MANAGEMENT METHOD

4.1 SITUATIONS REQUIRING VEGETATION CONTROL

Various situations occur in Western's service area that require some sort of vegetation control. The amount of control needed ranges from removal of all vegetation to reduce the potential of fire or tripping hazards (known as "bare ground control"), to the removal or topping of tall growing vegetation only. On private land, responsibility for vegetation management and control is often Western's and may, based on the terms of the easement contract, require compensation to the landowner for damages to crops or trees. Contract language may also specify that "orchards" are allowed under the conductor. Contracts are generally reviewed by the Regional Realty Officers to determine the extent of Western's right to maintain or clear vegetation, including removal of danger trees. On Federal lands, responsibility for vegetation management and control is Western's, but is restricted based upon land and resource plans that dictate tree removal or trimming criteria within or adjacent to the right-of-way area. **Table 4-1 lists the various situations requiring vegetation control and type of control needed.**

Vegetation control can be either **selective** or **non-selective**, based on the site requirements. In areas that require bare ground control, **non-selective methods** are used and generally consist of applications of non-selective herbicides (see Section 4.2). Along transmission rights-of-way, most areas are appropriate for **selective** vegetation control methods that meet the requirements for control but also promote a stable, low growing cover, which benefits wildlife, minimizes erosion, and requires minimum maintenance over the years. Selective control methods for rights-of-way include physical/mechanical (cutting), biological, and chemical (herbicide application) methods. **The characteristics of non-selective vegetation control versus selective vegetation control are summarized in Table 4-2.**

TABLE 4-1
SITUATIONS REQUIRING VEGETATION CONTROL

| Situation | Control Required (reason) |
|--|--|
| <ul style="list-style-type: none"> • Areas within substations, storage yards, switchyards, microwave stations | Bare Ground Control (to prevent fires, tripping) |
| <ul style="list-style-type: none"> • Around the bases of wood pole structures | Bare Ground Control (to prevent fires) |
| <ul style="list-style-type: none"> • Along access roads | Removal/Control of all trees, shrubs, and noxious plants (to provide access) |
| <ul style="list-style-type: none"> • Around the bases of non-wood structures | Removal/Control of all trees, shrubs, and noxious plants (to provide safe access) |
| <ul style="list-style-type: none"> • Within the transmission line ROW | Removal/Control of all tall-growing trees and shrubs (to prevent outages from line contact/flashover) |
| <ul style="list-style-type: none"> • Noxious Weeds (on fee land and selected rights-of-way where a noxious weed control program is in place and Western has accepted responsibility for noxious weed infestation) | Removal/Control of target noxious weeds (to prevent spread of damaging noxious weeds) |

TABLE 4-2
NON-SELECTIVE VS. SELECTIVE CONTROL METHODS

| Non-Selective Vegetation Control | Selective Vegetation Control* |
|---|--|
| <ul style="list-style-type: none"> • Removal of most or all vegetation - substations, yards, etc. • Act upon most vegetation and leave soil non-productive for a year or more, depending on the herbicide selected and the rate used. • Act on a wide variety of plants, but most non-selectives do not affect all plants equally. | <ul style="list-style-type: none"> • Tall growing plants and trees that would interfere with transmission lines can be removed without harming low growing species • Generally advantageous to wildlife by encouraging food, shelter, and natural corridors for movement. • Development of stable, low growing ground cover should require a minimum of maintenance over the years. |

* **Selective Control** is Western's policy for vegetation control on transmission line rights-of-way.

4.2 VEGETATION MANAGEMENT METHOD SELECTION

4.2.1 What Methods Are Available?

The principles of IVM emphasize that there are several methods that can be used to control (manage) unwanted vegetation. These methods generally fall into one of the following three major categories:

- **Biological** - use of living organisms to control vegetation; examples are use of **grazing** animals and release of **insects** that prey on certain noxious weeds.
- **Physical/Mechanical** - use of **physical labor/hand saws** and mechanical devices such as **mowers** to cut unwanted vegetation.
- **Chemical** - use of **herbicides** to chemically control vegetation; this can involve a number of different treatment/application methods, such as:
 - Foliage Spraying (spraying the leaves)
 - Basal Spraying (spraying the base of the tree/brush)
 - Stump Treatment (spraying cut stumps, stump injection)
 - Soil Treatment (spraying soil or applying granules, pellets, powders)
 - Newer methods using chemicals: Tree Growth Regulators and Biobarriers

The remainder of this section focuses on what factors should be considered in selecting the best/most appropriate method.

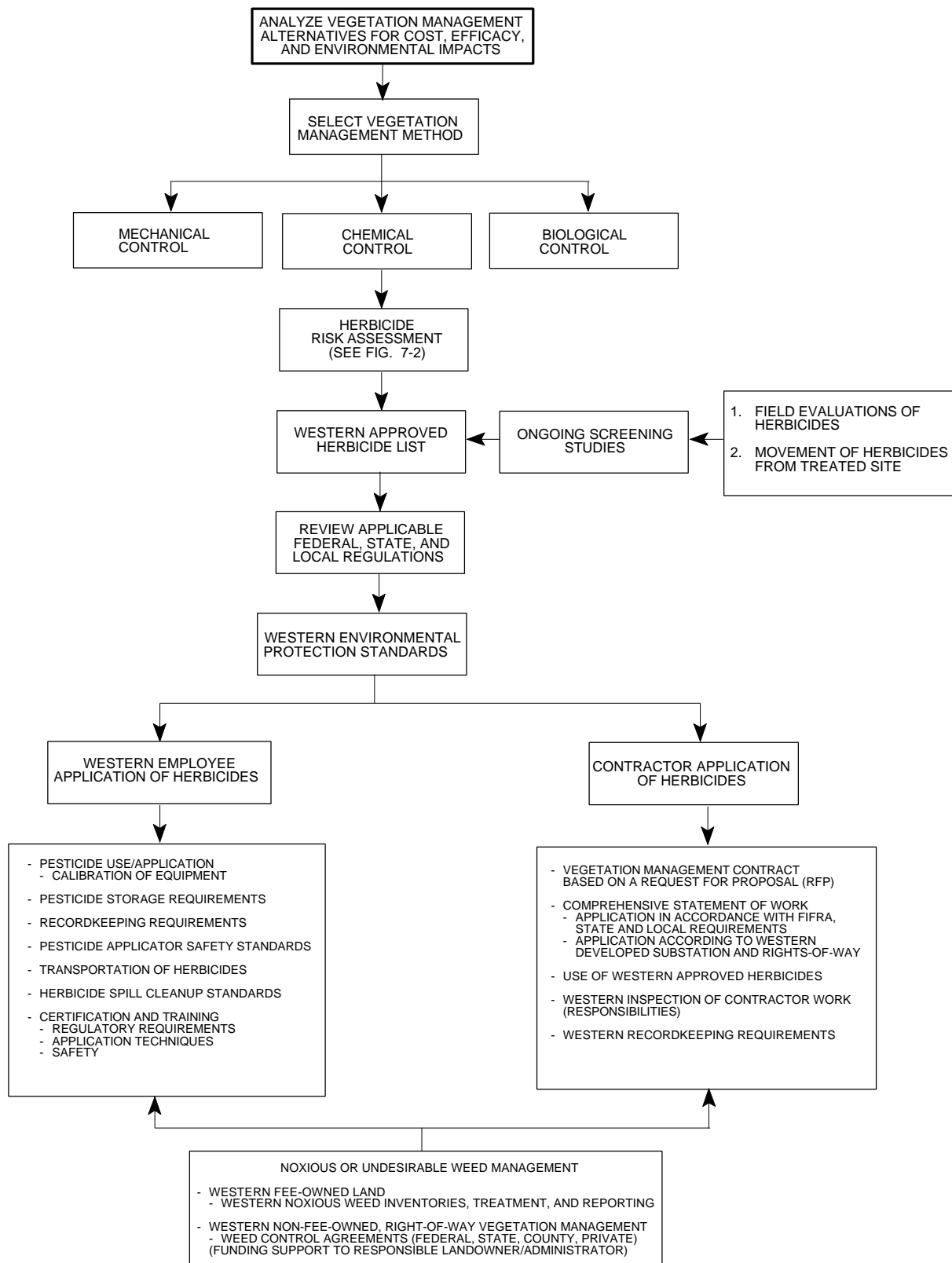
4.2.2 Considerations in Selecting the Best Method

The specific method(s) used to control unwanted vegetation should be selected based on safety, cost, effectiveness, and potential environmental impacts. **Table 4-3 lists factors which should be considered in the selection of a vegetation control method. Table 4-4 summarizes the advantages and disadvantages of each major control method and the different application/treatment options that are used by Western.** Table 4-4 also lists where use of each method is usually most appropriate.

The selection of a vegetation control method is based on the factors listed in Table 4-3 and a good deal of professional judgement. However, there are **general guidelines** that can be used in selecting the most appropriate method in treatment for a specific need and/or specific site. **Table 4-5 provides general guidelines based on the type of vegetation control needed and the site situations that are typically encountered in Western's service area.** This table should be used in conjunction with Table 4-4 and the information provided in the following section to determine the best method for the particular situation. As Figure 4-1 illustrates, the selection of a vegetation management method is the first step in Western's IVMP and can lead into numerous decisions, procedures, and regulatory aspects if the chemical control method is selected. Section 7.0 of this manual discusses chemical control methods in detail; Sections 5.0 and 6.0 provide overviews of the biological and physical/mechanical options. Section 13.0 discusses tree growth regulators and biobarriers.

TABLE 4-3
FACTORS WHICH INFLUENCE DECISION ABOUT SPECIFIC
VEGETATION CONTROL METHOD TO USE

-
-
- Safety
 - Line Voltage (which determines conductor clearance criteria - see Section 10.0)
 - Proximity to restricted or sensitive environmental areas
 - Type and density of vegetation - target and nontarget species
 - Expected growth rates
 - Size of treatment area
 - Anticipated costs and equipment limitations
 - Effectiveness of possible treatments
 - Special agreements with the landowner or land managing agency
 - Accessibility
 - Climate/meteorological conditions at time of treatment
 - Herbicide use regulations
 - Treatment objective
-



SELECTION OF A VEGETATION CONTROL METHOD AND CHEMICAL CONTROL CONSIDERATIONS
WESTERN AREA POWER ADMINISTRATION

FIG. 4-1

TABLE 4-4

VEGETATION CONTROL METHODS: ADVANTAGES AND DISADVANTAGES

| Method | Advantages | Disadvantages | Where use is most appropriate |
|--|--|---|---|
| <u>BIOLOGICAL:</u> | | | |
| 1. Introduce Natural Insect Predators | <ul style="list-style-type: none"> • Targets specific noxious plants • Perpetual, inexpensive | <ul style="list-style-type: none"> • Intense monitoring efforts • Availability of insects • Long-term control option | <ul style="list-style-type: none"> • Specific noxious weeds that can be controlled with specific insects, e.g., musk thistle |
| 2. Animal Grazing | <ul style="list-style-type: none"> • Effective control • Cost-effective • Provides nitrogen | <ul style="list-style-type: none"> • Timely grazing management is needed • Also affects valuable vegetation • Soil compaction • Degrades riparian areas • Soil erosion on steep slopes | <ul style="list-style-type: none"> • Where agreement exists with landowner who raises livestock - existing "rangeland" |
| <u>PHYSICAL/MECHANICAL:</u> | | | |
| 1. Manual Clearing with chain saw, machete, axe, etc. | <ul style="list-style-type: none"> • Very selective • Low soil impact • Minimal disturbance of riparian and other sensitive areas | <ul style="list-style-type: none"> • Low production rates • High cost • If done without herbicide application, plants may resprout quickly • Safety concerns for workers - falls, cuts, exposure to poisonous plants, snakes, etc. • Exposure to vapors, dust | <ul style="list-style-type: none"> • In sensitive areas • In areas with low-moderate stem density • Where topping/trimming is mandated by agreement with land management agency or landowner |
| 2. Mowing with "brush hog" mower; mowing grass/weeds with lawn mower | <ul style="list-style-type: none"> • High production rates • Low cost | <ul style="list-style-type: none"> • Not selective - removes non-target plants • If done, without herbicide application, plants may resprout quickly • Slope, topographic restrictions • Some soil disturbance • Creates slash • High labor requirement for lawn mowing | <ul style="list-style-type: none"> • Non sensitive visual/environmental areas • High stem density of small, noncompatible brush • Areas with restrictions on herbicide use • Vegetation will not resprout rapidly • Lawns/yard areas at substations and other facilities |

**TABLE 4-4
(Continued)**

| Method | Advantages | Disadvantages | Where use is most appropriate |
|-------------------------------|---|--|---|
| 3. Blading/Scarification | <ul style="list-style-type: none"> • Low cost • Effective | <ul style="list-style-type: none"> • High erosion potential due to soil disturbance • Not selective • High visual impact • Creates slash | <ul style="list-style-type: none"> • As "last resort" where cannot gain access due to density of brush (i.e., along access routes to reach danger trees) • Non-sensitive visual/ environmental areas only |
| 4. Use of Geotextile barriers | <ul style="list-style-type: none"> • Low cost • Effective, especially when placed during initial construction/landscaping | <ul style="list-style-type: none"> • May not eliminate unwanted vegetation that remains beneath barrier (roots) • Need to use during initial construction/landscaping • Not always stable on slopes | <ul style="list-style-type: none"> • Landscaped areas • Level ground • New construction |

CHEMICAL

1. Nonselective Herbicides

| | | | |
|-----------------|--|---|---|
| 1A. Spray | <ul style="list-style-type: none"> • No moisture needed to activate • Relatively low cost | <ul style="list-style-type: none"> • Spills harder to contain/clean • Need to be mixed • Higher drift hazard | For any non-selective situation - where "bare ground control" is needed; for certain noxious weeds if applied selectively |
| 1B. Granules | <ul style="list-style-type: none"> • No need for mixing • Drift hazard low • Simple application equipment | <ul style="list-style-type: none"> • Often more expensive than liquid • May need moisture to activate | Around substations, yards, wood poles; possibly spot-treatment of certain noxious weeds |
| 1C. Biobarriers | <ul style="list-style-type: none"> • Combine effectiveness of geotextile barrier with herbicide • Time-release control | <ul style="list-style-type: none"> • Must install during initial construction to be cost effective | <ul style="list-style-type: none"> • Initial substation/yard construction |

**TABLE 4-4
(Concluded)**

| Method | Advantages | Disadvantages | Where use is most appropriate |
|---|---|---|--|
| 2. <u>Selective Herbicides</u> | | | |
| 2A. Stump treatment (Spray or capsule injection) | <ul style="list-style-type: none"> • Very selective • Limited or no drift to non-target vegetation • Capsule injection - no chemical mixing; exposure limited | <ul style="list-style-type: none"> • Timing critical - must apply immediately after cutting to be effective • Early spring treatments not as effective as later season • Capsule injection may require training and is labor intensive | <ul style="list-style-type: none"> • Initial clearing • Maintenance clearing when trees are too tall for foliage spray • Near areas sensitive to drift, runoff |
| 2B. Selective basal bark treatment | <ul style="list-style-type: none"> • Selective • Limited drift to non-target vegetation • No brownout if applied during dormant season | <ul style="list-style-type: none"> • Need to use oil-base formulation for best penetration | <ul style="list-style-type: none"> • Maintenance clearing if brush too tall for foliage spray or need more selectivity |
| 2C. Selective (low-vol.) foliar application | <ul style="list-style-type: none"> • Less costly than others because less labor intensive, no oil use | <ul style="list-style-type: none"> • Higher potential for drift onto non-target vegetation and workers • Not as effective during hot weather • More potential for runoff • "Brownout" causes visual impact | <ul style="list-style-type: none"> • Maintenance treatment when brush is 12-15 feet high and mostly tall-growing species. <u>Not</u> near areas sensitive to drift or "brownout." |
| 2D. Growth Inhibitors (Grass) | <ul style="list-style-type: none"> • Less costly than mowing because less labor intensive • Lengthens maintenance cycles | <ul style="list-style-type: none"> • Potential for drift onto nontarget vegetation | <ul style="list-style-type: none"> • Maintenance treatment where it is not practical to mow, but ground cover is desired. |
| 2E. Tree Growth Regulators | <ul style="list-style-type: none"> • Control branch growth without need for frequent pruning/trimming • Long term maintenance cycles • More aesthetic than topping, hard pruning • More cost-effective than frequent trimming | <ul style="list-style-type: none"> • Will require training or contracting for application • May be less effective on smaller diameter trees on certain species • Requires some time before see results | <ul style="list-style-type: none"> • In sensitive areas (especially visual sensitivity) • Where topping/trimming is mandated by agreement with land management agency or landowner |
| <u>All Herbicides:</u> | <ul style="list-style-type: none"> • Prevent resprouting of woody vegetation - lengthen maintenance cycles; reduce costs; promote stable low-growing cover | <ul style="list-style-type: none"> • Environmental and safety concerns - drift to nontarget organisms, water contamination, proper application | |

TABLE 4-5

CONTROL METHOD SELECTION GUIDELINES

| Type of Vegetation Control Need and Situation | Typical or Recommended Method/Treatment | | Notes |
|--|--|---|---|
| <u>BRUSH CONTROL ON ROW</u> | | | |
| <ul style="list-style-type: none">Within 10 feet of stream or water body | <ul style="list-style-type: none">ManualChemical | <ul style="list-style-type: none">CuttingStump treatment, Basal Treatment | <ul style="list-style-type: none">Use only herbicide approved for use in or near water bodies and registered in state being applied - e.g., Rodeo® |
| <ul style="list-style-type: none">Within 50 feet of stream or water body | <ul style="list-style-type: none">ManualChemical | <ul style="list-style-type: none">CuttingStump Treatment, Foliage Spray, Basal Treatment | <ul style="list-style-type: none">Use only herbicide approved for use in or near water bodies and registered in state being applied - e.g., Rodeo® |
| <ul style="list-style-type: none">Away from stream or water body, low density brush | <ul style="list-style-type: none">BiologicalManualChemical | <ul style="list-style-type: none">Animal grazingCuttingStump treatment, Basal TreatmentFoliage spray (selective) | <ul style="list-style-type: none">Animal grazing method appropriate only where agreement exists with landowner, and appropriate plants/livestock (e.g., "rangeland") |
| | | | Do <u>not</u> use foliage spray if: <ul style="list-style-type: none">High wind, hot temperaturesCannot prevent drift to sensitive non-target vegetation nearby (e.g., crops)Brownout is a problemBrush over 15 feet highBrush contains many low-growing shrubs and only a few tall-growing species |
| <ul style="list-style-type: none">Away from stream or water body, high density brush | <ul style="list-style-type: none">MechanicalManualChemical | <ul style="list-style-type: none">Brush Hog/MowerCuttingBasal TreatmentFoliage spray | <ul style="list-style-type: none">See limits on foliage spray, aboveLimit mechanical methods to non-sensitive visual/environmental areas and to areas with restrictions on herbicide use; use blade/scarification only as last resort method. |

TABLE 4-5
(Continued)

| Type of Vegetation Control Need and Situation | Typical or Recommended Method/Treatment | | Notes |
|--|--|---|--|
| <ul style="list-style-type: none"> • Adjacent to susceptible crops or plantings | <ul style="list-style-type: none"> • Manual • Chemical | <ul style="list-style-type: none"> - Cutting - Stump treatment, Basal spray | <ul style="list-style-type: none"> • Check herbicide labels for specific susceptible non-target crops; do not spray under high wind conditions; use low-drift formulations |
| <ul style="list-style-type: none"> • At scenic viewpoints such as highway crossings and recreation areas (to maintain vegetation screens) or where agreements require limited clearing. | <ul style="list-style-type: none"> • Manual • Chemical | <ul style="list-style-type: none"> - Topping, trimming - Tree Growth Regulators (see Section 13.0) | <ul style="list-style-type: none"> • In some very sensitive visual areas, topping/trimming may be required. Landowners should be told that if topping is excessive to meet required clearances, the tree may die. Tree growth regulators may be a better alternative. |
| <u>WOOD POLE PROTECTION ON ROW</u> | | | |
| "Bare ground" control needed around wood poles | <ul style="list-style-type: none"> • Chemical | <ul style="list-style-type: none"> - Foliage spray, soil surface treatment (e.g., granules) | <ul style="list-style-type: none"> • Use <u>non-selective</u> herbicide; watch for nearby sensitive crops, plants, water bodies and read labels |
| <u>ACCESS ROADS/NON-WOOD STRUCTURE ACCESS</u> | | | |
| Need control of brush and poisonous/noxious weeds to allow for safe access | <ul style="list-style-type: none"> • Chemical • Mechanical | <ul style="list-style-type: none"> - Foliage spray, basal spray - Soil surface treatment (granules) - mowing; possibly blading | <ul style="list-style-type: none"> • If possible, use selective herbicide that is especially effective on the target brush and noxious weeds • Avoid mechanical clearing if able to drive over brush; use blading only as last resort if brush too thick to allow access needed. |

TABLE 4-5
(Concluded)

| Type of Vegetation Control Need and Situation | Typical or Recommended Method/Treatment | | Notes |
|--|---|---|---|
| <u>SUBSTATION WEED AND BRUSH CONTROL</u> | | | |
| Need "bare ground" control | <ul style="list-style-type: none">• Manual• Chemical | <ul style="list-style-type: none">- Hoeing, hand pulling, geotextile mats- Soil surface treatment (liquid, granules); foliage spray; biobarriers | <ul style="list-style-type: none">• Use <u>non-selective</u> herbicide; watch for nearby sensitive crops, plants, water bodies and read labels. Use non-leaching chemical especially if have shallow groundwater. |
| Need low vegetation | <ul style="list-style-type: none">• Manual | <ul style="list-style-type: none">- Mowing | <ul style="list-style-type: none">• Can mow weeds, grass in areas where bare ground conditions not necessary. |
| <u>NOXIOUS WEED CONTROL</u> | | | |
| | <ul style="list-style-type: none">• Biological• Chemical | <ul style="list-style-type: none">- Insect predator introduction- Foliage spray | <ul style="list-style-type: none">• use of insect-based control is species-specific and dependent on if there is an effective insect predator• check Table 11-1 for most effective herbicides for specific noxious weeds. If within 50 feet of water body, use chemical approved for use on/near water bodies (e.g., Rodeo®) |

5.1 TYPES OF BIOLOGICAL CONTROL USED BY WESTERN

The use of biological control methods is usually limited by the existence of specific conditions on Western's rights-of-way. Western uses both **introduced insects** and **animal grazing** to control or compete with target vegetation. Generally, the use of grazing requires that the property owner has the desire to graze livestock, adheres to the required maintenance program, and is responsive to concerns about environmental impacts (e.g., in riparian areas). Introduction of insect predators requires a specific pest/predator relationship.

5.2 CONTROL OF WEEDS BY INTRODUCED INSECTS

Weed control through the use of natural biological agents, such as microorganisms, insects, or other animals, is theoretically attractive. Advantages of this approach include potential effectiveness, selectivity for only particular target species, and ability to be self-sustaining, energy efficient, and inexpensive over the long term (DOE 1983). However, development of suitable and successful control agents can involve considerable time and expense. Control agents must be host-specific (i.e., attack only the target species) to prevent cross-over damage to desirable crops or vegetation. This requirement limits the likelihood of controlling the wide variety of weed species encountered in natural environments. Unforeseen side effects of introduced agents are possible. To date, most successful uses of this method have involved control of exotic weeds established outside of their natural ranges and therefore not held in check by natural enemies.

Western is participating with the Colorado Department of Agriculture and the local Weed Control District in a program using the musk thistle seed head weevil (*Rhinocyllus conicus*) to control musk thistle growth. Colonies of these insects were introduced at the Curecanti Substation in Montrose County in an attempt to establish them as self-sustaining predators on the musk thistle. This program will continue to be evaluated as part of Western's Integrated Vegetation Management policy.

The release of the musk thistle weevil is Western's biological control program. If it is effective, Western will look at other locations where a similar program might also work, such as North Dakota. Also, if a weed is the object of an active weed control campaign and Western's actions have contributed to the weed problem, Western will cooperate with the biological control efforts of local Weed Control Districts.

5.3 ANIMAL GRAZING

In a few instances on established rangeland, Western has used animal grazing to control vegetation. This method is used where the landowner has a desire to graze livestock, the vegetation is appropriate (palatable, usable), and tall-growing woody species are infrequent or easily controlled (cut) by the landowner. Generally this method is restricted to grassy rangeland and pastureland, and it works well with the cooperation of the landowner. Care should be taken to ensure that grazing of livestock on Western fee-owned land does not interfere with facility operations and activities.

5.4 ESTABLISHMENT OF STABLE, LOW-GROWING PLANT SPECIES

In general, the preferred outcome of Western's IVMP is the establishment of low-growing vegetation that does not interfere with transmission or substation facilities or hamper access. Traditional methods (i.e., chemical, manual, and mechanical) for achieving this goal are corrective in that they act to remove tall-growing plants that have already established on a site. Planting and encouraging low-growing native species that will occupy growing space and compete with target species is a type of biological control in itself, because low-growing species act to prevent the establishment of tall-growing plants.

The proper use of selective herbicides and selective cutting can result in the development of stable shrub/grass/forb communities that resist invasion of tall-growing tree species. A more pro-active measure involves the actual seeding of grasses or grasses/forb mixtures that then preclude the establishment of trees. This approach is discussed in more detail under Section 12.0 - Revegetation/Reclamation.

In general, the establishment of low-growing shrubs, forbs, and grasses on rights-of-way often provides browse and cover for wildlife and corridors for wildlife movement, thereby enhancing wildlife habitat.

6.1 PHYSICAL METHODS

Physical methods include use of manual labor to cut vegetation or install geotextile weed control mats. Manual methods use hand labor to remove or control target plants. High selectivity results from treatment of individual target plants. Manual methods are constrained by vegetation conditions (e.g., density) and topography.

6.1.1 Cutting

The most common manual method is cutting target plants with power saws. Other manually-operated tools such as axes, machetes, and clippers may also be used. This technique is highly effective on species that do not resprout. Conifers must be cut below the lowest live limb to prevent regrowth from upturned branches, but they do not resprout. Most hardwood trees and shrubs, however, do resprout and should be treated with herbicides (i.e., cut stump treatment) to prevent regrowth.

Without herbicide treatment after cutting, sprouts may rapidly resurge to original height within several years and at much greater density than the original stems (DOE 1983). Access for subsequent manual treatments is thereby hindered. General Western practice is to use cut stump herbicide applications on the stumps of resprouting species following cutting.

Manual cutting operations by Western are sometimes followed by slash disposal techniques designed to reduce fire hazard or to improve aesthetic appeal. The slash is lopped and scatted uniformly across the treated area (thereby hastening natural decomposition). Small trees are limbed on one side so they lie flat on the ground. Alternatively, branches and small trees are fed into a mechanical chipper; chips are spread over the right-of-way or deposited in piles. Stems too large for chipping are lopped and scatted within the right-of-way as the situation requires.

6.1.2 Girdling

Girdling involves manually cutting away bark and cambial tissues around the trunk of target trees. Conifer species are killed by this treatment, but hardwoods frequently will resprout below the girdle unless the cut is treated with herbicide. Girdling results in standing dead trees (i.e., snags) which are left to decompose and fall on their own. Girdling is rarely practiced by Western but may be appropriate where large trees cannot be safely felled by cutting.

6.1.3 Topping and Trimming

Topping involves cutting a tree at some height up the trunk to prevent it from growing into transmission lines or microwave beam paths without felling the whole tree. Trimming or pruning is the removal of selected branches from tree trunks for the same purposes. These highly labor-intensive techniques are used by Western in special situations where it is desirable to leave trees in place as visual screens (e.g., along roads, streams, rivers, campgrounds, and Forest Service roads) or where easement contracts and land/resource plans dictate tree removal or trimming criteria.

6.1.4 Hand Pulling and Hoeing

Substation weed control, right-of-way noxious weed control, and wooden pole protection theoretically can be accomplished by hand pulling and hoeing. Weeds that resprout from rootstocks or root fragments in the soil are not controlled by these methods. Such manual treatments are not practical for large areas such as substations and yards requiring bareground control.

6.1.5 Use of Geotextile Barriers

Geotextile “weed barriers” or landscape fabrics made of synthetic material can be placed on the ground around plantings in landscaped areas or under gravel yards or surfaces. They inhibit weed growth by shutting out light, yet allow water penetration. However, they contain no chemicals to provide longer-lasting or systemic control (see Biological Barriers, Section 13.0). Weeds can resprout through the mats if the root

remains under the mat and if gaps or holes develop. Also, these are most cost-effective when installed during initial construction plantings (landscaped areas). When properly installed, geotextile barriers can result in a reduction of surface-applied herbicides, so consideration should be given to their use (or the use of biological barriers) when planning new yards or landscaped areas.

6.2 MECHANICAL METHODS

Mechanical methods employ machines to remove or control target vegetation. These are nonselective methods in that all plants on a site are affected. Use of machines may be restricted, however, to patches of target plants. Mechanical methods may be highly effective at controlling brush on gentle topography with few site obstacles. Most mechanical equipment is not safe to operate, however, on slopes over 30-35 percent. These methods are also constrained where soils are highly susceptible to compaction or erosion. Site obstacles such as rocks, stumps, or logs also reduce their efficiency. Because of these limitations, Western does not propose to use mechanical methods extensively in its vegetation management program.

6.2.1 Mowing

On rights-of-way, mechanized heavy equipment with high-speed rotary blades may be used to cut, chop, flail, or shred woody vegetation. Vegetation is typically cut off near ground level, leaving low ground cover of grasses and other herbaceous plants. Examples of this type of mowing equipment are known as brush-hog, Track-Mack, and Hydro-Ax. The equipment available at the present time, however, is not capable of performing safely, neatly, or efficiently on the steep topography characteristic of most rights-of-way where woody vegetation is a problem. Also, unless herbicides are applied, resprouting of hardwoods will occur. Because of these limitations, mowing is generally not used extensively on rights-of-way in Western's service area. At substations and other yards, however, mowing with lawn or tractor mowers is used extensively to cut grass and does not have the limitations associated with right-of-way mowing.

6.2.2 Blading/Grubbing

Crawler tractors equipped with brush blades or rakes may be used to physically uproot woody plants. By a combination of cutting and lifting action, roots are ripped out and buried or pushed to brush piles, where they may be later burned. Disruption of the soil surface is severe; erosion may be a subsequent problem. Therefore, this method is only used as a last resort on rights-of-way if needed to provide access through dense brush. It may be used at substations, where blading can level out gravel yards and also provide weed removal at the same time.

7.1 CLASSIFICATION AND TYPES OF HERBICIDES

An herbicide is a type of pesticide used to kill or suppress the growth of plants. The most satisfactory classification of herbicides is based upon how they are used for weed control and how they work.

Classification by Use

- **Selective herbicide** implies that certain weeds are killed but most desirable plants are not significantly injured. Many selective herbicides kill broadleaf plants (including brush) but do not affect grasses.
- **Nonselective** refers to chemicals that are generally toxic to plants without regard to species. Remember, plants differ in susceptibility to any specific chemical and the choice of herbicide and application rate depends on the species to be controlled.

Classification by Mode of Activity

There are generally three classes of herbicides based on activity (all may be selective or nonselective):

- **Contact herbicides - foliage applied** - control weeds by direct contact with plant parts. They are referred to as chemical “mowers,” as only the plant area contacted is controlled. Good coverage is necessary.
- **Translocated or systemic herbicides - foliage applied** - products move through the entire plant system in both the water stream and the food stream. They accumulate in, and affect the active growth centers. In general, these compounds are selective. Some are effective in the soil and can be taken into the plant through the roots. However, they are most effective when applied to the plant foliage.

- **Residual soil-active herbicides** - soil applied - are sometimes referred to as “soil sterilants”. The length of time the soil remains relatively weed-free depends upon the chemical used, amount applied, rainfall, soil type, and the plant species invading the treated area.

Figure 7-1 illustrates how contact, translocated, and nonselective residual herbicides work.

Compounds that can be used selectively in some situations may be used nonselectively by increasing the rate of application. Soil residual herbicides generally have little effect upon plants when sprayed on foliage. The main effect is when they are absorbed through the shoot or root and moved in the water stream of the plant to the leaves.

7.2 HERBICIDE FORMULATIONS

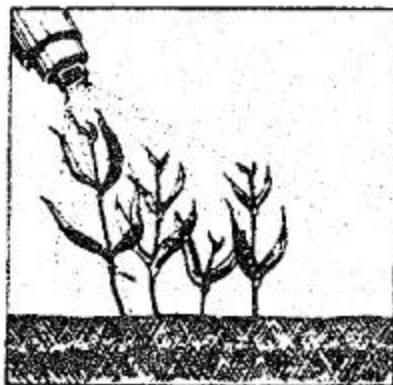
The active ingredients in a pesticide are the chemicals that control the target plant. The herbicide you purchase is rarely made up of only one active ingredient. Usually the herbicide is diluted in water or a petroleum solvent, and other chemicals are added before the product is offered for sale. These other chemicals may include wetting agents, spreaders, stickers, extenders, or diluents. They usually make the product safer, easier to apply, more convenient to handle, and more accurate to measure. This mixture of active and inert (inactive) ingredients is called a **herbicide formulation**. Some formulations are ready for use. Others must be further diluted with water, a petroleum solvent, or air by the user before they are applied.

7.2.1 Types of Formulations

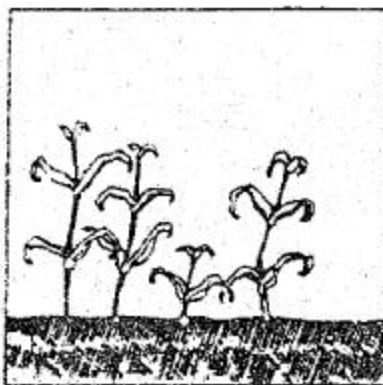
A single active ingredient often is sold in several different kinds of formulations. You must choose the formulation that will be best for each use. In making your choice, consider:

- Application machinery available and best suited for the job
- Hazard of drift and runoff (nearness to sensitive areas, likelihood of wind or rain)

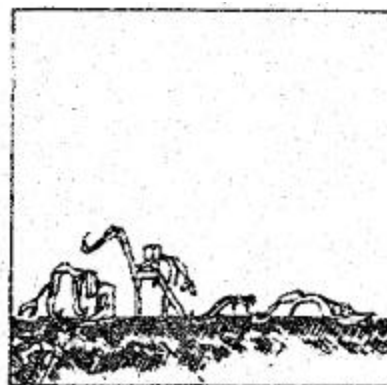
CONTACT HERBICIDES HALT VISIBLE PLANT GROWTH, AT LEAST FOR A SHORT TIME



Spraying of visible plant foliage initiates the action of a contact herbicide. A spray wand or spray boom is used to apply the compound, with application being made after growth has started.



Herbicide is taken into the plant leaves where it interferes with growth processes. The plant begins to curl, wither, and then turn brown.



Weed growth above ground is eliminated. Some weeds will not come back but many will reappear later in the season, since germinating seeds or perennial root systems are usually not affected by contact materials.

HOW A FOLIAGE TRANSLOCATED HERBICIDE WORKS



Spray growing vegetation to wet.

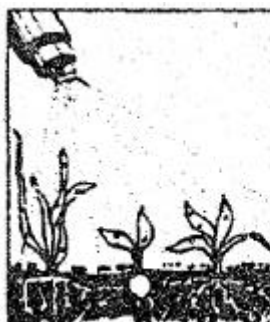


Chemical translocated down to roots and growing points and throughout the plant.



Susceptible plant then gradually dies.

HOW A NONSELECTIVE RESIDUAL WORKS



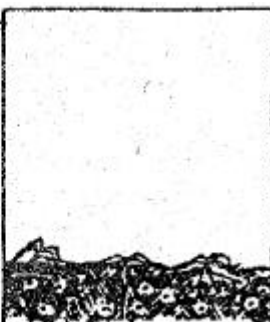
Apply to soil and young plants in early spring.



Rain washes herbicide in the soil; It dissolves and is absorbed by shoots or roots.



Herbicide is translocated to growing points, plant yellows and gradually dies.



Plants die and bare ground occurs for a year or more

SOURCE: BPA 1994

CONTACT, TRANSLOCATED, AND
RESIDUAL HERBICIDES

- Safety to applicator, helpers, and other humans and pets likely to be exposed
- Habits or growth patterns of the plant to be controlled
- Cost

7.2.1.1 Liquid Formulations

Emulsifiable Concentrations (EC or E)

An emulsifiable concentrate formulation usually contains the active ingredient, one or more petroleum solvents, and an emulsifier which allows the formulation to be mixed with water. Each gallon of EC usually contains 2 to 8 pounds of active ingredient. EC's are among the most versatile formulations. They are used against agricultural, ornamental and turf, forestry, structural, food processing, livestock, and public health pests. They are adaptable to many types of application equipment, from small, portable sprayers to hydraulic sprayers, low-volume ground sprayers, mist blowers, and low-volume aircraft sprayers.

Advantages:

- **High concentration means price per pound of active ingredient is relatively low and product is easy to handle, transport, and store.**
- Little agitation required; not abrasive; will not settle out or separate when equipment is running.

Disadvantages:

- **High concentration makes it easy to overdose or underdose through mixing or calibration errors.**
- Easily absorbed through skin of humans or animals.
- May be corrosive.

Invert Emulsions

This unusual mixture contains a water-soluble pesticide dispersed in an oil carrier. Invert emulsions require a special kind of emulsifier that allows the pesticide to be mixed with a large volume of petroleum carrier, usually fuel oil. When applied, invert emulsions form large droplets which do not drift easily. Invert emulsions are most commonly used in vegetation control along rights-of-way where drift to susceptible nontarget plants is a problem.

7.2.1.2 Granules (G)

The sandy particles are made from an absorptive material such as clay, limestone, corn cobs, or walnut shells. The active ingredient either coats the outside of the granules or is absorbed into them. The amount of active ingredient is relatively low, usually ranging from 1 to 15 percent.

Granular pesticides are most often used to apply chemicals to the soil to control weeds, nematodes, and insects living in the soil. They also may be used as residual herbicides - formulations that are applied to the soil, then absorbed into the plant through the roots and carried throughout the plant.

Advantages:

- **Ready to use; no mixing.**
- **Drift hazard is low - particles settle quickly.**
- **Low hazard to applicator - no spray, little dust.**
- Weight carries the formulation through foliage to soil target.
- Simple application equipment - often seeders or fertilizer spreaders.

Disadvantages:

- **More expensive than Wettable Powders or EC's.**
- **May need to be incorporated into soil.**
- **May need moisture to activate pesticidal action.**

7.2.1.3 Pellets (P or PS)

Pellet formulations are very similar to granular formulations; the terms often are used interchangeably. A pellet, however, is a formulation manufactured to create a pellet of specific weight and shape. The uniformity of the particles allows them to be applied by precision applicators such as those being used for precision planting of pelleted seed.

7.2.1.4 Wettable Powders (WP or W)

Wettable powders are dry, finely ground formulations which look like dusts. They usually must be mixed with water for application as a spray. Wettable powders contain 5 to 95 percent active ingredient, usually 50 percent or more. Wettable powder particles do not dissolve in water. They settle out quickly unless constant agitation is used to keep them suspended.

Wettable powders are one of the most widely used pesticide formulations. They can be used for most pest problems and in most types of spray machinery where agitation is possible.

Advantages:

- **Low cost.**
- **Easy to store, transport, and handle.**
- **Easily measured and mixed.**
- **Less skin and eye absorption than EC's and other liquid formulations.**

Disadvantages:

- **Require good and constant agitation (usually mechanical) in the spray tank.**

- **Inhalation hazard to applicator while pouring and mixing the concentrated powder.**
- Abrasive to many pumps and nozzles, causing them to wear out quickly.

7.2.1.5 Dry Flowables (DF)

Dry flowables are highly concentrated granules designed to break up and disperse in water in a manner similar to that of wettable powders. These require agitation, and have similar advantages and disadvantages as those listed for wettable powders.

7.2.2 Adjuvants

An adjuvant is an inert material added to a pesticide formulation or tank mix to increase the effectiveness of the active ingredient. Most pesticide formulations contain at least a small percentage of additives. Some applicators add additional adjuvants while mixing for special applications. Some product labels may caution the user against adding adjuvants. Common adjuvants are:

Wetting agents - allow wettable powders to mix with water and stick on plant or animal surfaces.

Emulsifiers - allow petroleum-based pesticides (EC's) to mix with water.

Invert emulsifiers - allow water-based pesticides to mix with petroleum carrier.

Spreaders - allow pesticide to form a uniform coating layer over the treated surface.

Stickers - allow pesticide to stay on the treated surface.

Penetrants - allow the pesticide to get through the outer surface to the inside of the treated area.

Drift Control Agents - these include:

- **Foaming agents** - reduce drift.
- **Thickeners** - reduce drift by increasing droplet size.

7.2.3 Compatibility

Two or more pesticides which can be mixed together to control a wider range of pests with a single application are said to be compatible with each other. Sometimes the pesticides are formulated together by the manufacturer, but the applicator often must mix separate formulations in the tank. It is important to remember that not all pesticides work well in combination. Pesticides which are not compatible can cause:

- Loss of effectiveness against the target pests.
- Injury to the treated surface (phytotoxicity in plants, toxicity in treated animals, stains or corrosion on treated surfaces).
- Separation of ingredients into layers or settling out of solids.

Some pesticide labels list other pesticides with which the produce is compatible.

7.3 WESTERN-APPROVED HERBICIDES

Several factors have been considered in selecting appropriate, effective and safe herbicides for use in Western's IVMP. A survey was conducted to determine which EPA-registered herbicides are currently being used successfully throughout the Western service area. This list will then be examined, and any herbicides that are no longer listed for non-crop uses or that may be problematic because of their environmental characteristics (e.g., high leaching potential, persistence) or high toxicity will be eliminated (see Figure 7-2 for general herbicide "risk assessment"

screening process). **Table 7-1 lists those herbicides that passed the screen and are Western's currently approved herbicides.** Information derived from a risk assessment conducted by the U.S. Forest Service and the Bonneville Power Administration will be used to assess the risk of effects to humans and nontarget species from using herbicides in the Integrated Vegetation Management Program (USDA 1992).

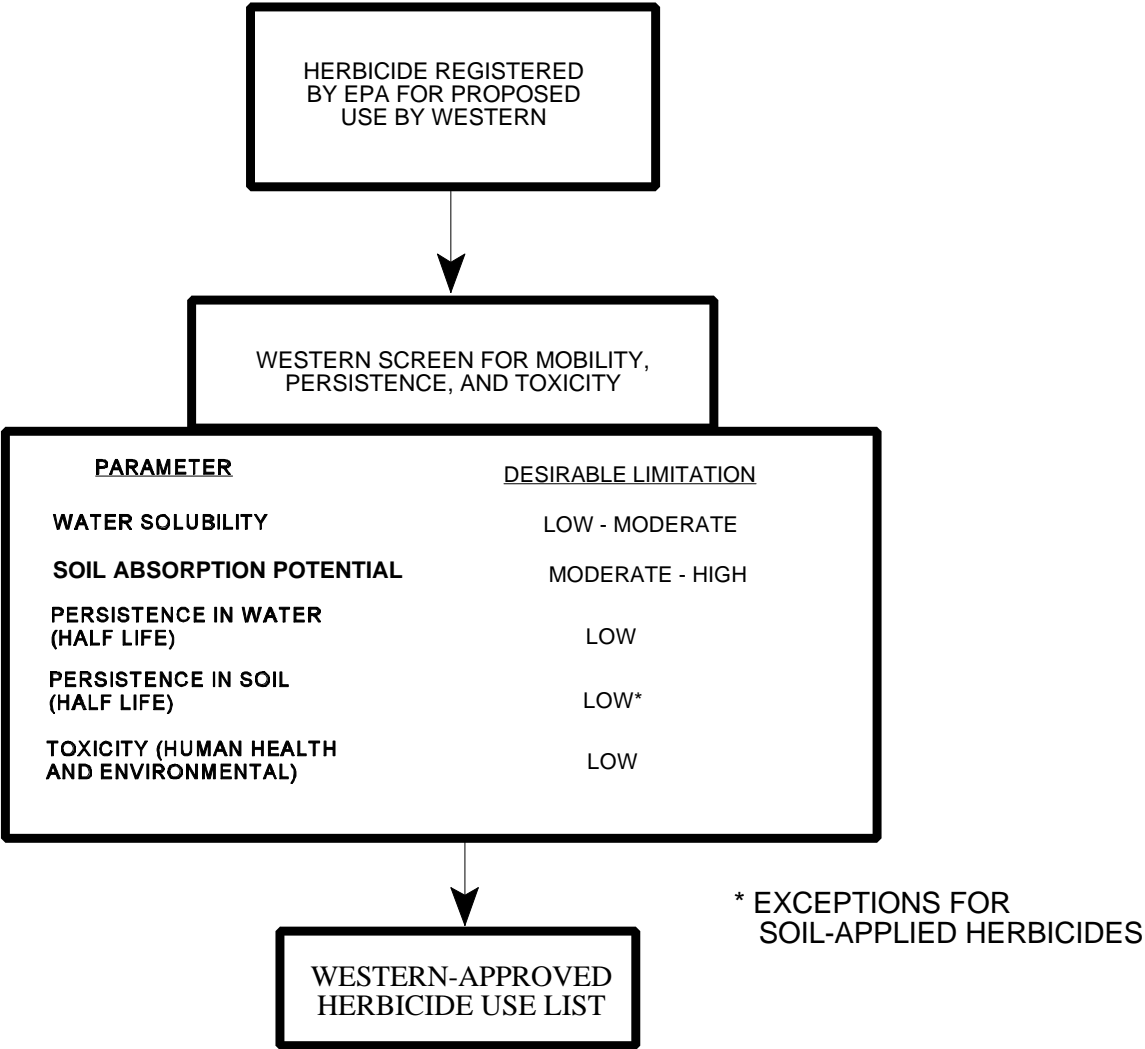
Even though the herbicides listed on Table 7-1 are “approved,” it does not mean that they are equally appropriate, effective, or safe, given different site conditions and locations. In selecting a particular herbicide and formulation to use, it is important that the label be read and understood, and that the particular site conditions be considered and “matched” to the label precautions and type of herbicides (e.g., selective vs. nonselective). Also, one must check to see if the herbicide is restricted to certain uses under State regulations. Table 7-2 presents some factors that should be considered in selecting a particular herbicide/formulation for vegetation control.

To help in determining which herbicide is most appropriate, Tables 7-3 and 7-4 present Western's approved herbicides, along with information on:

- Relative toxicity
- Persistence
- Leaching potential
- Label restrictions
- State-specific restrictions
- Formulation or application method normally used

Table 7-3 lists the **non-selective** herbicides that are used primarily at substations and yards. Table 7-4 lists the **selective** herbicides that affect broadleaf plants and trees, but not grasses, and are used on rights-of-way, plus some selective preemergent herbicides and growth regulators used at substations, yards, and tree screens.

HERBICIDE RISK ASSESSMENT



HERBICIDE RISK ASSESSMENT SCREENING PROCESS

FIGURE 7-2

TABLE 7-1
WESTERN APPROVED HERBICIDES
(Current as of 1999)

| Herbicide | Trade Name | EPA Registration Number | Manufacturer* | Use |
|-------------------------------|---|--|--|--|
| Bromacil and Diuron | Krovar 1 DF [®] | 352-505 | DuPont | Substations |
| Chlorsulfuron | Telar [®] | 352-404 | DuPont | ROW |
| Clopyralid | Transline [®] | 62719-73 | Dow AgroSciences | Noxious Weed Control |
| 2,4-D | Esteron 99 [®] Weedar 64 [®] HI-DEP [®] | 62719-9-264 264-2AA 2217-703 | Rhone Poulenc Rhone Poulenc PBI/Gordon | Substations, ROW Substations, ROW Substations, ROW |
| Diglycolamine salt of Dicamba | Vanquish [®] | 55947-46 | Sandoz | ROW (Stump Treatment), Substations |
| Diuron | Karmex DF [®] | 352-508 | DuPont | Substations |
| Fosamine Ammonium | Krenite S [®] , Krenite UT [®] | 352-395 | DuPont | ROW |
| Glyphosate | Roundup [®] | 524-445 | Monsanto | Substations |
| | Roundup PRO [®] Roundup D-PAK [®] Rodeo [®] (aquatic) EZJECT [®] | 524-475 524-436 524-343 524-435 | Monsanto Monsanto Monsanto Monsanto | Stump Injection |
| Imazapyr | Arsenal [®] (liquid) | 241-273 | American Cyanamid | Substations, ROW |
| | Stalker [®] | 241-296 | American Cyanamid | Stump Treatment |
| | Arsenal 0.5G [®] | 241-295 | American Cyanamid | Substations, some ROW (around wood poles) |
| Picloram | Tordon RTU [®] Tordon 22K [®] | 62719-31 62719-6 | Dow AgroSciences | ROW (Stump Treatment) ROW |
| Sulfometuron Methyl | Oust [®] | 352-401 | DuPont | Storage Yards, Subs |
| Mefluidide | Embark PGR [®] Embark 2S [®] (Plant growth regulator) | 2217-759 7182-7 | PBI/Gordon PBI/Gordon | Buffers, around subs. (on grass) |
| Imazapyr and Diuron | Topsite 2.5G [®] | 241-344 | American Cyanamid | Substations, some ROW |
| | Sahara DG [®] | 241-372 | American Cyanamid | Substations |
| Triclopyr | Garlon 3A [®] Garlon 4 [®] Pathfinder II [®] | 62719-37 62719-40 62719-176 | Dow AgroSciences | ROW Stump Treatment |

**Table 7-1
(Concluded)**

| Herbicide | Trade Name | EPA Registration Number | Manufacturer* | Use |
|------------------|---|--|----------------------|--|
| Pendamethalin | Pendulum WDG® | 241-340 | American Cyanamid | Substations |
| Oryzalin | Surflan A.S.® | 62719-113 | Dow AgroSciences | Substations |
| Fluroxypyr | Vista® | 62719-308 | Dow AgroSciences | ROW, Substation esp. for <u>Kochia</u> |
| Fluprimidol | Cutless® (Tree growth regulator - implant) | 62719-237 | Dow AgroSciences | ROW (sensitive area) Substations (screens) |
| Paclobutrazol | Profile 2SC® (Tree growth regulator) | 62719-234 | Dow AgroSciences | ROW (sensitive areas) Substations (screens) |
| Trifluralin | Biobarrier® Biobarrier II® | 59823-1 59823-3 | Reemay | Substations, yards |

*Phone numbers and Internet addresses for the major herbicide manufacturers are provided in Appendix Q.

Herbicide specimen labels can be obtained from the manufacturer (See Appendix Q) or from Van Diest Supply Company (1-800-779-2424). The labels provide more detail regarding restrictions and precautions. See Table 7-5 for “highlights” that are important to look for when reading pesticide labels.

Table 7-6 explains the different EPA toxicity ratings, which are indicated on herbicide labels by the signal words “Danger/Poison,” “Warning,” or “Caution.” These signal words tell how acutely toxic the herbicide is (i.e., if the herbicide is harmful within 24 hours of exposure or can damage the eyes or skin).

Special care should be taken if a “Danger/Poison” classified herbicide is selected for use. In general, Western prefers to limit use of herbicides that are classified as “Danger/Poison” and has included only two (2,4-D and Garlon 3A®) on its approved list. The vast majority of herbicides have low toxicity to humans and are relatively safe to humans and animals if used properly. Worker exposure is minimal with the proper use of personal protective equipment (e.g., chemically resistant gloves, respirators if needed, etc. - see Section 7.6.3 - Applicator Safety Requirements).

Rates of application for weed control are often given in minimum and maximum amounts, depending on the situation. The reason for the range in application rates is that control is influenced by differences in response to weed species, stage of growth when treatment is made, the period of residual toxicity desired, the amount and distribution of rainfall, soil texture and organic matter, and other environmental conditions. Refer to Table 7-7, “Situations Where Minimum and Maximum Rates of Herbicides Are Needed,” for suggestions in selecting the proper rate for a specific situation.

TABLE 7-2
FACTORS TO CONSIDER IN SELECTING A HERBICIDE

| Factor | Comment |
|---|---|
| <ul style="list-style-type: none"> Type of control needed | Generally use <u>non-selective</u> herbicides for “bareground” control situations only or where can apply <u>very</u> selectively. |
| <ul style="list-style-type: none"> Type of undesirable species | Check label/literature or applicator experience for plant susceptibility to certain herbicides; see Table 11-1 for herbicides recommended for specific noxious weeds. |
| <ul style="list-style-type: none"> Potential damage to adjacent crops and/or desirable vegetation (from soil-applied herbicides) | Do not use herbicides which have the potential to move offsite into crops. Check label for precautions. Use only herbicides that will not injure or destroy desirable plants by root absorption if roots of desirable plants extend under area to be treated. |
| <ul style="list-style-type: none"> Potential pollution of surface water - proximity and topography | Use only a herbicide approved for use close to water bodies where runoff could carry herbicide to water. |
| <ul style="list-style-type: none"> Potential pollution of groundwater - site geology/soils and depth to groundwater | Use a herbicide with low leaching potential and low persistence if groundwater is shallow and/or soils are sandy (permeable) and have low organic matter. Check label for particular susceptibilities; use low-drift formulation and nonpersistent herbicide. |
| <ul style="list-style-type: none"> Exposure of humans and animals | Check label for restrictions; use low toxicity herbicide. |

TABLE 7-3

NON-SELECTIVE HERBICIDES

| Chemical Common Name | Trade Name(s) | Treatment Method(s) Available ⁷ | Soil Persistence | Leaching Potential | Toxicity Signal Word | Label Restrictions (see label for details) | State Restricted Use (R.U.) or Prohibited Pesticide? |
|--------------------------------|--|---|---|---|-------------------------|--|--|
| Bromacil + Diuron ¹ | Krovar 1 DF [®] | Soil Treatment | Bromacil: Remains active in the soil for 7 months to more than 1 year, depending on application rate. ¹ Half-life is 5-6 months (90 days) ⁶ . (See also Diuron) | Bromacil: relatively high; ⁶ more likely if soils are low in organic matter ¹ . (See also Diuron) | Caution | Limit drift; use in/near water, wetlands; endangered species habitat; inhalation skin/eye contact; combustible; do not apply to permeable soil or if drinking water aquifer present. | Yes R.U. in CA, CO, TX |
| Diuron ² | Karmex DF [®] | Soil Treatment | One month to more than one year depending on application rate. Half-life is 60 days. ⁶ | Moderate ⁶ | Warning | Limit drift; use in/near water, wetlands; sensitive crops; reentry until sprays have dried; skin/eye contact; soil type restrictions. | Yes - R.U. in CA, CO |
| Glyphosate ⁴ | Roundup [®] , Rodeo [®] (aquatic) EZJECT [®] | Foliage Spray | Depends on soil texture and organic matter content. Half-life is from 3-130 days ¹ (30 days). ⁶ Not active in soil. | Low potential ^{1,6} | Warning | Limit drift; use in/near endangered species habitat; skin/eye contact; inhalation; ingestion. | No |
| | | Stump Injection | | | | | |
| Imazapyr ⁴ | Arsenal [®] Stalker [®] | Soil Treatment | Broken down by exposure to sunlight and by soil microorganisms. Remains active in the soil for 6 months to 2 years. ¹ Half-life in soil is 90 days ⁶ . | Low potential ^{1,7,8} | Caution | Limit drift; use in/near water, wetlands, irrigation ditches or water flows onto agricultural land; endangered plants and habitat; inhalation, ingestion, skin/eye contact. | Yes - Arsenal [®] not registered for use in CA for rights-of-way or industrial use. |

**TABLE 7-3
(Concluded)**

| Chemical Common Name | Trade Name(s) | Treatment Method(s) Available ⁷ | Soil Persistence | Leaching Potential | Toxicity Signal Word | Label Restrictions (see label for details) | State Restricted Use (R.U.) or Prohibited Pesticide? |
|----------------------------------|--|---|--|---|-------------------------|---|--|
| Imazapyr & Diuron | Sahara DG [®] Topsite 2.5 G [®] | Soil Treatment | See Imazapyr and Diuron (more like Diuron) | See Imazapyr and Diuron (more like Diuron) | Caution | Do not apply to water/surface water present; avoid contact with eyes, clothing; can injure offsite crops, plants. | Yes - not registered for use in CA. Diuron - R.U. in CA, CO. |
| Sulfometuron Methyl ² | Oust [®] Herbicide | Soil Treatment | Half-life in soil is 60 days ⁶ . | Relatively high ⁶ . | Caution | Limit drift; inhalation; skin/eye contact; use in/near water; particles that move off site can damage non-target crops, vegetation. Do not treat frozen soil. | Yes - not to be used in specified counties of CO: Saguache, Rio Grande, Alamosa, Costilla, Conejos (see label). |

- 1 Source: BPA Pesticide Fact Sheets for Bromacil (BPA 1994b)
- 2 Source: BPA Pesticide Applicators Course for Operations Personnel (BPA 1994a)
- 3 Source: Colorado Weed Management Association (no year)
- 4 Source: BPA Pesticide Fact Sheets (BPA 1994b)
- 5 Source: Kansas State University Cooperative Extension Service (1988)
- 6 Source: Weed Control Handbook (Whitson et al. 1993-1994)
- 7 Source: A. Roybal, pers. comm. (1995)
- 8 Source: Weed Science Society of America, Herbicide Handbook (1989)

TABLE 7-4
SELECTIVE HERBICIDES

| Chemical Common Name | Trade Name(s) | Treatment Method(s) Available ⁶ | Soil Persistence | Leaching Potential | Toxicity Signal Word | Label Restrictions (see label for details) | Restricted Use (R.U.) or Prohibited Pesticide? |
|---|---|---|--|---|--|---|--|
| Chlorsulfuron ¹ | Telar [®] Herbicide | Foliage Spray | 6-12 months residual ² . Half-life of 1-3 months. ¹ (30 days) ⁴ | High potential in permeable soils. ^{4,1} | Caution | Limit drift, use near endangered plants; inhalation; contact with skin/eyes. | Yes - Not to be used in specified counties of Colorado: Saguache, Rio Grande, Alamosa, Costilla, and Conejos (see label). |
| Clopyralid ¹ | Transline [®] | Foliage Spray | Moderate residual ² 1-5 months. Half-life of 2-10 weeks. (20 days) ⁴ | Relatively high. ⁴ | Caution | Human health - ingestion, skin/eye contact. Do not apply to water, where have permeable soils. | No |
| 2,4-D ¹ | Esteron 99C [®] Weedar 64 [®] HI-DEP [®] | Foliage Spray | 30 days at highest application rate. ¹ Half-life of 10 days. ⁴ | Small (ester) to moderate (acid and amine) ⁴ | Danger - Hi-Dep and Weedar 64 Caution - Esteron 99C | Limit drift, use in/near water, wetlands; endangered species; human health- ingestion, inhalation and skin/eye contact. | Yes - R.U. in CA, NM, TX |
| Diglycolamine Salt of Dicamba ⁵ | Vanquish [®] | Foliage Spray Stump Treatment | 2-5 months residuals depending on rate of application and soil type. ² Half-life of 1-6 weeks. ¹ | Relatively high ¹ - can leach into groundwater. | Caution | Limit drift; inhalation; skin/eye contact; ingestion; use near water or sensitive crops. | Yes - R.U. in CA, TX. |
| Fosamine ⁵ Ammonium | Krenite S [®] Krenite UT [®] | Foliage Spray | Broken down quickly by soil. ³ Half-life of 7 days. ⁴ | Very low-none. ^{4,5} | Warning | Limit drift, use in/near surface water; can apply to floodplains. | Yes - not labeled for use in CA or AZ. |
| Picloram ¹ | Tordon RTU [®] Tordon 22K [®] | Stump Treatment Foliage Spray | 6-12 months residuals. Half-life of 90-120 days depending on rate of application and soil type. ^{2,4} | Relatively high - can leach into groundwater in certain soil (low organics) and weather conditions. ¹ | Warning | Limit drift, use in/near water, wetlands, ditch banks; endangered plants and invertebrates; inhalation; skin/eye contact. | Yes - not labeled for use in CA; R.U. in all other states for Tordon 22K [®] ; Tordon RTU [®] is not restricted use. ⁵ |

**TABLE 7-4
(Continued)**

| Chemical Common Name | Trade Name(s) | Treatment Method(s) Available ⁶ | Soil Persistence | Leaching Potential | Toxicity Signal Word | Label Restrictions (see label for details) | Restricted Use (R.U.) or Prohibited Pesticide? |
|---|---|--|--|---|--|--|---|
| Triclopyr ¹ | Garlon 3A [®] Garlon 4 [®] Pathfinder II [®] | Foliage Spray Basal Treatment | Moderately residual. Half-life or 46 days. ¹ | Low to Moderate - leaching potential depends on soil type, acidity, and rainfall. ¹ | Danger - Garlon 3A Caution - Garlon 4 Caution - Pathfinder II | Limit drift, use near endangered plants; irrigation ditches, domestic water; inhalation skin/eye contact; combustible. | No |
| Pendamethalin (does not affect many weeds, trees) | Pendulum WDG [®] | Soil Treatment (Preemergent control; often used in mix with Roundup [®] in landscaped areas) | Half-life of 60 days. ⁶ | Low ⁶ | Caution | Toxic to fish; do not apply to water; limit drift. Avoid contact with eyes, skin, clothing. May discolor sprayed surfaces. | No |
| Oryzalin (does not affect many weeds, trees) | Surflan A.S. [®] | Soil Treatment (Preemergent control; often used in mix with Roundup [®] in landscaped areas) | Half-life of 60-90 days. ^{4,6} | Low ^{4,6} | Caution | Do not apply to water; limit drift; avoid contact with skin, eyes, clothing. May discolor sprayed surfaces. | No |
| Melfluidide ⁵ | Embark [®] (Plant Growth Regulator) | Foliage Spray | Not persistent in soil. Half-life of 2 days. | Low - adsorption on the soil insignificant. | Caution | Limit drift; do not allow animals to graze on treated areas; avoid contact with skin, clothing; do not apply to water. | No |
| Fluprimidol | Cutless [®] Tree Growth Regulator | Tree implants | N/A - implanted in tree (Half-life of <6 months on bare soil.) ⁸ | N/A - implanted in tree. | Caution | Do not apply to water or where surface water present. Avoid contact with eyes, skin, clothing. Do not use on trees harvested for food (fruits, nuts, sap) or trees that are in poor condition. | No |

**TABLE 7-4
(Concluded)**

| Chemical Common Name | Trade Name(s) | Treatment Method(s) Available ⁶ | Soil Persistence | Leaching Potential | Toxicity Signal Word | Label Restrictions (see label for details) | Restricted Use (R.U.) or Prohibited Pesticide? |
|-------------------------|---|--|--|---|-------------------------|--|--|
| Paclobutrazol | Profile 2SC [®] Tree Growth Regulator | Soil drench, Soil injection | Average half-life = 1-3 years. ⁶ | Very low. High adsorption, low solubility. ⁶ | Caution | Do not apply to water or where surface water present; avoid contact with skin, eyes, clothing. (Can affect nearby non-target vegetation) | No |
| Trifluralin | Biobarrier [®] Biobarrier II [®] | Subsurface herbicide impregnated geotextile placement | Half-life of 60 days. ⁴ | Usually high ⁴ , but probably lower in this product (time- release nodules) | Caution | Toxic to fish; do not apply to water or wetlands; avoid contact with eyes, skin, clothing. | No |
| Fluroxypyr | Vista [®] | Foliage Spray | Half-life of 1-4 weeks. ⁷ | Relatively low sorptivity and therefore has <u>potential</u> for leaching, but also low water solubility and rapid dissipation in field. ⁷ | Warning | Toxic to fish; do not apply to water or wetlands; drift can affect non-target aquatic organisms and plants. | No (Prohibited in AZ for use on crops or grazing land) |

- ¹ Source: BPA Pesticide Fact Sheets.
- ² Source: Colorado Weed Management Association.
- ³ Source: Kansas State University Cooperative Extension Service.
- ⁴ Source: Weed Control Handbook.
- ⁵ Source: A. Roybal, pers. comm.
- ⁶ Source: B. Massey, Dow Elanco, pers. comm. and fact sheets.
- ⁷ Source: Vista Herbicide Technical Guide, Dow AgroSciences.

TABLE 7-5

PESTICIDE LABEL HIGHLIGHTS

-
- **Always read the label before you use it!**
 - Pesticide labels include all the written information provided by the manufacturer about the product
 - Pesticide Name:
 1. Brand or Trade Name:
The name by which the pesticide is sold
"Karmex DF®"
 2. Common Name:
The shorter name for the active ingredients in the product
"Diuron"
 3. Chemical Name:
The complex names for the individual active ingredients
"Diuron [3-(3,4 - dichlorophenyl)-1, 1-dimethylurea]"
 4. Active Ingredients:
The chemicals used to kill the target pest
"diuron ... 80%"
 - Types of Use: Each pesticide is registered to be used for only specific purposes
 - Name and Address of Manufacturer
 - Registration and Establishment Numbers
Karmex DF® EPA Reg. No 352-508-Registration number
e.g., EPA Est. 55947-TX-1 - State where product was made (Texas)
 - SLN "Special Local Need" is noted when pesticide products are approved by specific states

e.g., "EPA SLN No. KS-770009" or approved as a special local need for use in Kansas
 - Signal Words Danger/Poison/Skull & crossbones - Highly toxic
Warning - Moderately toxic
Caution - Slightly/not so toxic
-

TABLE 7-5
(Concluded)

| | | |
|---|----------------------------------|---|
| • | Directions for Use | Notes when the pesticide should be applied and compatibility with other products |
| • | Registered Uses | <p>This is usually noted under the directions for use:</p> <ul style="list-style-type: none"> • restricted use: use only by certified applicators or under their supervision • general use or "General Classification": can be used by non-certified applicators and the public at large <p>"General use herbicide for non-cropland brush and weed control" - Pesticides may be used for only those uses noted on the label. All other uses would violate the label and FIFRA requirements.</p> |
| • | Dilution Rate | Exactly how much of the product should be mixed with water or other carrier for the use selected |
| • | Precautionary Statements | Notes if the product is hazardous to people or domestic animals; health hazards |
| • | Statement of Practical Treatment | First Aid measures Notes to physicians |
| • | Environmental Hazard | Notes if the product is harmful to the environment |
| • | Physical and Chemical Hazards | <p>Lists special fire, explosion or chemical hazards</p> <ul style="list-style-type: none"> - "combustible" (i.e., Garlon 4, due to kerosene as an inert ingredient) - "corrosive - store in corrosion-resistant tank" |
| • | Re-Entry Statement | Notes the time that must pass before workers enter the treated area without personal protective clothing |

Source: Adapted from BPA 1994.

TABLE 7-6
TOXICITY CATEGORIES

| | Signal Word on Label | | | |
|--------------------|---|--|---|---------------------------------------|
| | "Danger/ Poison" | "Warning" | "Caution" | "Caution" |
| Relative Toxicity: | Highly Toxic | Moderately Toxic | Slightly Toxic | Very Slightly Toxic/Nontoxic |
| Eye Effects: | Corrosive: corneal opacity not reversible in 7 days | Corneal opacity reversible within 7 days; irritation persisting for 7 days | No corneal opacity; irritation reversible in 7 days | No irritation |
| Skin Effects: | Corrosive | Severe irritation at 72 hours | Moderate irritation at 72 hours | Mild or slight irritation at 72 hours |

Source: BPA 1994b

TABLE 7-7
SITUATIONS WHERE MINIMUM AND MAXIMUM
RATES OF HERBICIDES ARE NEEDED

| Use Minimum Rates | Use Maximum Rates |
|-------------------------------|--|
| Herbaceous Plants | |
| Susceptible species | Tolerant species |
| Annuals | Perennials |
| Seedlings | Annuals and Biennials in flower |
| Perennials in bud | Established perennials - flower to maturity |
| Shallow-rooted | Deep-rooted |
| Residual Toxicity | |
| Short period | Several years |
| Arid regions | Humid regions |
| Soil Type | |
| Low in organic-matter content | High in organic-matter content |
| Low in clay content | High in clay content |
| Well drained | Poorly drained |
| Root-Absorbed Chemical | |
| Bare Soil | Heavy plant residue |

7.4 CHEMICAL CONTROL METHODS

There are several different ways to apply herbicides, and the method selected depends on the type of control needed, the type of vegetation, and the site situation (site conditions, location). Selecting the appropriate method was discussed in Section 4.2 and summarized on Table 4-5; this section expands on that information and describes the **specific procedures and precautionary measures for each treatment method**. These methods include:

- Stump treatment
- Basal spray/treatment
- Foliage spray/treatment (postemergence)
- Soil treatment (preemergence)
- Under surfacing materials treatment

Note that **tree growth regulators and biobarriers** are discussed in more detail in Section 13.0.

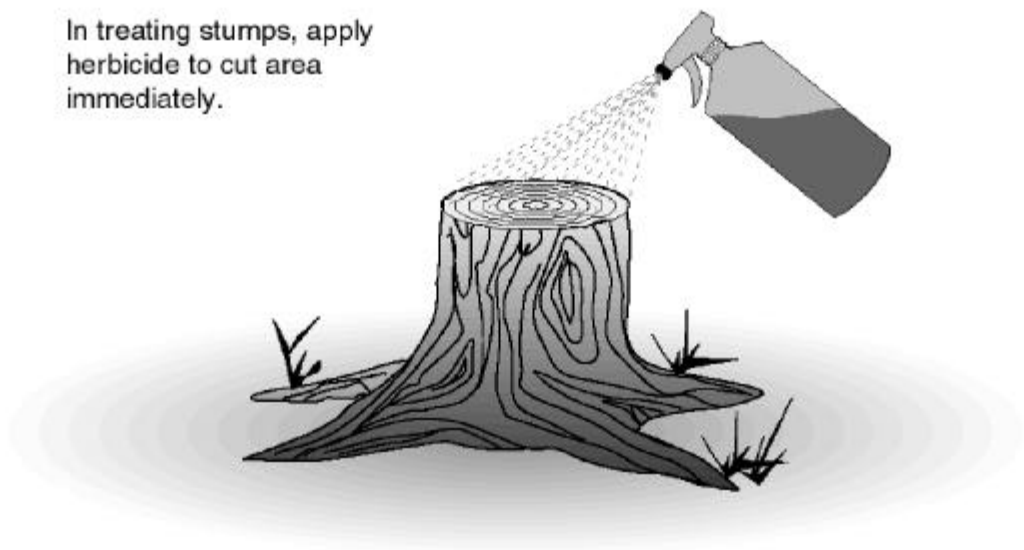
Generally, all of these are options for use on rights-of-way to control brush or noxious weeds. At substations and yards, non-selective herbicides are usually applied either as soil treatments or foliage applications.

7.4.1 Stump Treatment

Stump Treatment generally involves cutting a tree down and treating the freshly cut surface with either an oil-based mixture or a ready-to-use non-oil solution (Figure 7-3). This type of treatment is used when vegetation is cut to ground line. Therefore, its primary uses are: (1) initial clearing and (2) maintenance clearing when trees have grown too tall to foliage spray or drift is an issue. Products used for stump treatment include Stalker®, Tordon RTU®, Pathfinder II®, and Vanquish®.

To treat stumps, cut the top of the stump level to allow uniform herbicide coverage. Thoroughly wet the cambium layer next to the bark so the conducting tissue will carry the herbicide to the roots. On larger trees, treat only the outer 2 to 3 inches of the

In treating stumps, apply herbicide to cut area immediately.



Stump Treatment

Figure 7-3

stump (the internal heartwood of the tree is already dead). On trees 3 inches or less in diameter, treat the entire cut surface. Apply treatments immediately after cutting to achieve maximum effectiveness. If application is delayed after cutting, recut the stump and apply the herbicide to the live tissue. Delaying herbicide application to freshly cut trees can result in prolific resprouting from the tree collar and roots. Moisture stress may affect control during the summer and early fall. Applications done during early spring when sap is flowing upward are not as successful as applications done during late spring or early summer, when upward sap flow has lessened. Undiluted water-soluble herbicide formulations are more effective than the esters.

Stump injection is another method of stump treatment. The method that has been used within Western is the EZJECT® capsule injection system, which uses the herbicide glyphosate. The system is composed of two parts - an application lance and a ready-to-use glyphosate capsule. The herbicide is placed directly in the tree or stump, thereby avoiding drift or impacts to desirable vegetation. EZJECT® requires no mixing or measuring, so the applicator never comes in contact with the herbicide. Appendix O provides additional information on the EZJECT® system.

7.4.2 Basal Spray/Treatment

The **basal treatment** method involves spraying the lower part of the stem and the exposed roots of noncompatible vegetation with an oil-based formula (Figure 7-4). It is more selective than a foliage spray and does not produce immediate brownout of vegetation when applied during the dormant season. Therefore, this treatment may be prescribed where:

- Brush is too tall to foliage spray without causing unacceptable drift.
- The right-of-way is adjacent to cropland, residences, susceptible vegetation, or other sensitive areas, and drift is a problem.
- The right-of-way contains a high density of compatible species, and a foliage spray cannot be applied without injuring the compatible cover.

- The right-of-way is in a visually sensitive area where immediate brownout would be unacceptable, and, due to seasonal limitations, only those foliage sprays which cause immediate brownout can be used.

To basal spray, apply the herbicide to the lower 12 to 18 inches of the tree trunk or brush from early spring to mid-fall. Some species can be treated during winter, as long as snow/ice do not prevent contact of the chemical with the bark. The herbicide spray is often mixed with oil (diesel or kerosene), which acts as a carrier that adheres well to the tree trunk. Non-petroleum fatty acids (vegetable and animal oils) are now available, and these may be used as carriers for certain formulations. Examples of non-petroleum based oils are provided in Appendix G. Use herbicide spray mixed with oil until the bark is saturated. This method is effective on trees of all sizes, including brush. Examples of basal treatment herbicides include triclopyr-based Garlon 4® and Pathfinder II®.

7.4.3 Foliage Spray

Foliar spraying is a common method of applying herbicides on brush up to 15 feet tall. This method uses a water-based formulation, applied to the entire plant's foliage and stems (Figure 7-5). Because it is sprayed up into the air, drift can be a problem under certain conditions. Also, most foliage sprays cause immediate brownout of vegetation. Therefore, in cases where drift or brownout is a problem, either foliage spraying is eliminated, or an alternate treatment (basal, or cut and stump treatment) is prescribed.

To apply herbicides using a foliar spray, make applications from early summer to late September, depending on the choice of herbicide. Treatments are least effective during very hot weather and when trees are under severe water stress. Use 2,4-D (Esteron 99C®, Weedar 64®, HI-DEP®), triclopyr (Garlon 3A®), dicamba (Vanquish®), and picloram (Tordon 22K®) in early summer; glyphosate (Roundup®, Rodeo®) in August and September; and imazapyr (Arsenal®) from June through September for best results. Fosamine ammonium (Krenite®) is an additional choice and is labeled for use in floodplains and low lying areas where surface water is not present. Except in very sensitive species, spraying plants with rapidly elongating stems will often result in excessive sprouting. Saturation of the tree is not necessary.

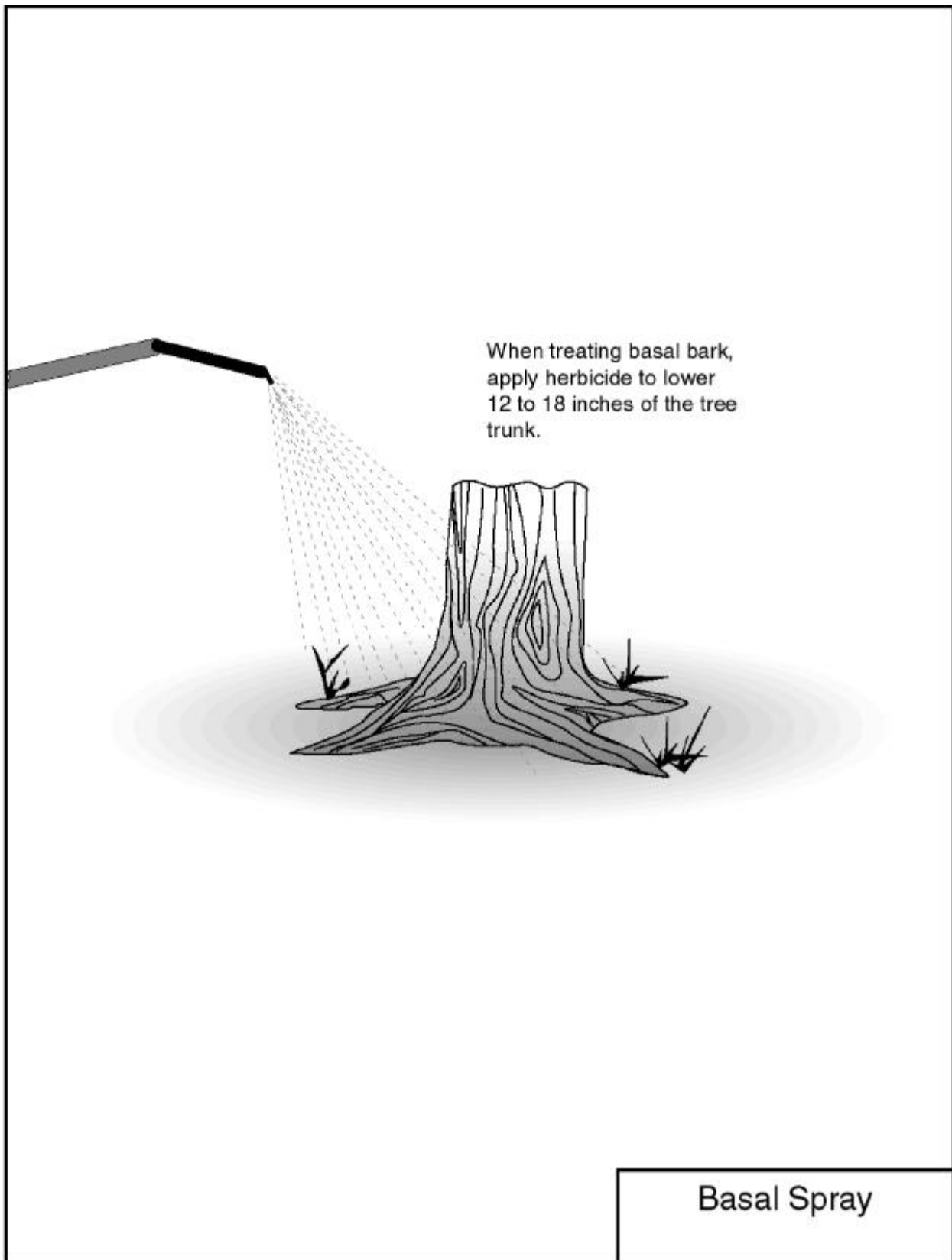


Figure 7-4

7.4.4 Soil Treatment

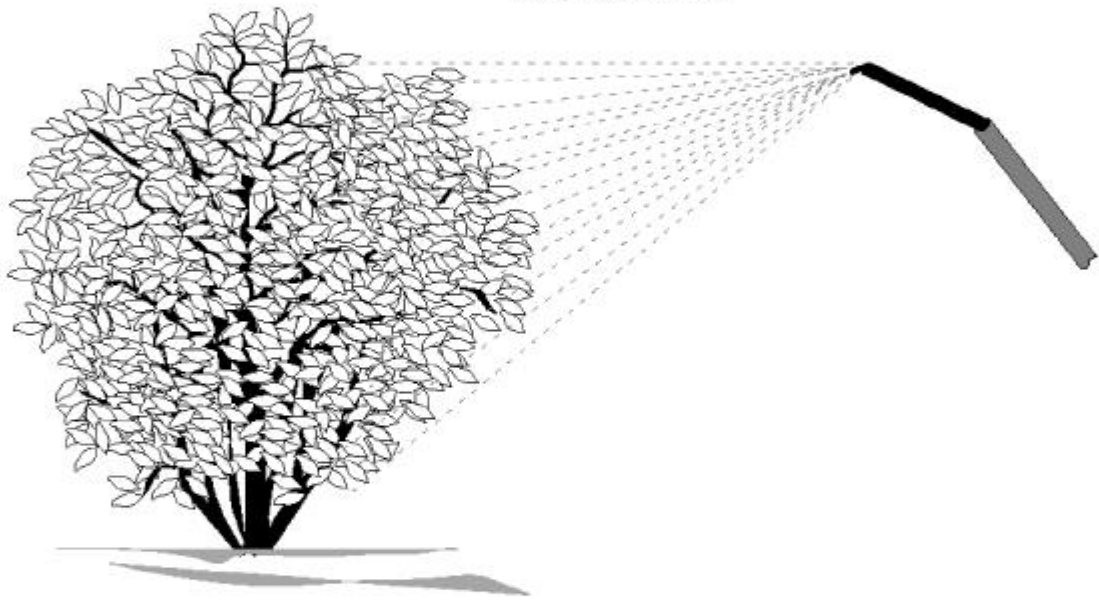
Herbicides considered "soil sterilants" may be defined as compounds that, when applied to the soil, prevent the establishment of vegetation, ranging from a short time to relatively long periods of time. In the soil treatment method, applications are made to the base of plants or, when non-selective treatment is needed, to the ground surface. These herbicides are available in both liquid and solid (granular or pellet) formulations. Herbicides in granular or pellet form require precipitation to become activated (Figure 7-6).

Herbicides applied evenly to the soil surface move into the root zone of the targeted plants with rainfall or overhead moisture. Common soil applied herbicide choices include diuron (Karmex DF®) and imazapyr (Arsenal®); diuron and imazapyr together in granular form (Topsite 2.5G®) or as a water-dispersible granule (Sahara DG®); or bromacil and diuron (Krovar I DF®). In bareground areas, near landscaped areas, oryzalin (Surflan A.S.®), or pendimethalin (Pendulum WDG ®) may be chosen for the control of weeds, especially in combination with glyphosate (Roundup®) if weeds are already present. For problem or noxious weed infestations, refer to Section 11.5.1 for information on herbicides recommended for each problem weed. For information on soil drench-applied tree growth regulators, see Section 13.0.

As a component of Western's Integrated Vegetation Management Program, Western will be developing multiple year weed control programs for substations and other yards where "total" or bare ground residual weed control is necessary. Following this type of vegetation management program for bare ground control offers high performance, economical use of funds, and labor savings. Western can eliminate all vegetation from a given site by establishing a multiple year program. This plan is based on an initial first year program, followed by several years with a maintenance program.

Consistency, when using bare ground herbicides, is achieved when reducing the influence of key limiting factors. Western's standard for bare ground control should be

Foliage treatments are used for brush up to 15 feet tall. Treatments are least effective during very hot weather or when trees are water stressed.



Foliage Spray

Figure 7-5

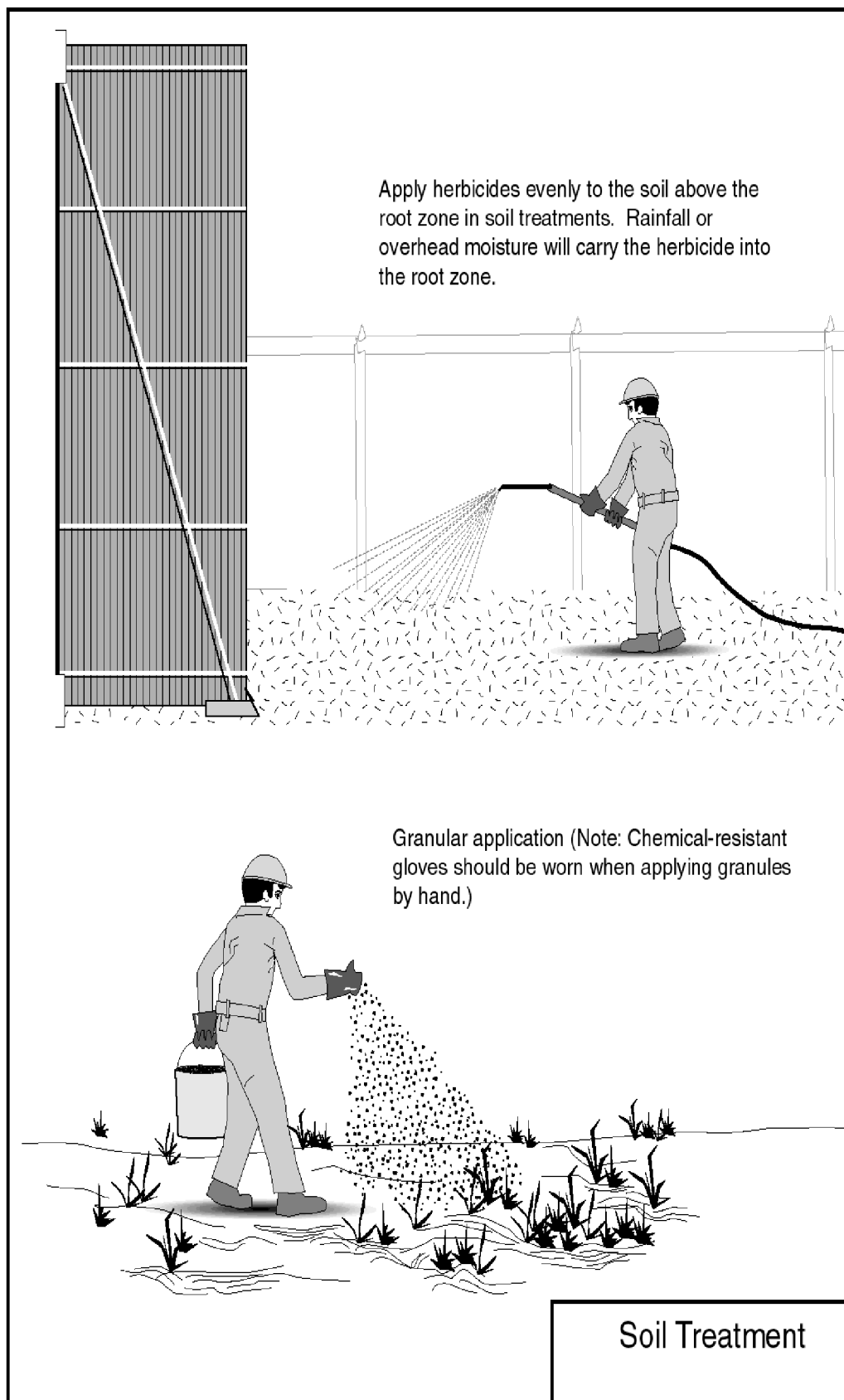


Figure 7-6

an area that is clean, free of weeds, for an entire growing season, at a reasonable price. To achieve this expectation, manage these seven limiting factors:

1. Skipping an annual treatment typically results in weed escapes.
2. Mismatching a herbicide to a tolerant weed will result in poor control.
3. Rate shaving the recommended rate results in weed escapes.
4. The use of weak, less persistent herbicides allows for regrowth on the site.
5. The lack of a multiple year program adds unnecessary retreatment cost.
6. Failure to initially clean up the site results in chronic control problems.
7. Applications made after the weeds have emerged, late in the season, typically result in reduced performance. The weeds become established and moisture is not present to properly activate the residual herbicide to place it in the root zone of the germinating weeds.

Initial Treatment (First year clean up)

This program is implemented when an area has not been previously treated or the area is experiencing weed escapes during the growing season. Costs of this program are higher, but performance is greater. A preemergent application must be used to clean up areas previously untreated or neglected. It is imperative to use herbicides with substantial “punch”. To control heavy perennial, biennial or annual weed populations, use:

Krovar I DF® (8-12 lbs.) --- This treatment is effective in controlling a wide range of difficult to control vegetation. Do not apply to areas where tree roots or desirable plants exist.

Arsenal® (2-3 pints) + Karmex DF® or another diuron product (6-10 lbs.) -- This tank mix treatment is effective in controlling a wide range of vegetation. Total vegetation control tank-mix rates depend on local rainfall. The manufacturer of Arsenal®, American Cyanamid, recommends the following guidelines to determine application rates for your area:

| Average Annual Rainfall (in inches) | Rate of Arsenal® plus Diuron® (per acre) |
|--|---|
| Less than 25 | 2-3 pints plus 6-8 pounds |
| Greater than 25 | 3-4 pints plus 8-10 pounds |

An alternative to preparing a tank mix of Arsenal® (imazapyr) and Karmex DF® (diuron) is to use the product Sahara DG®. This contains both imazapyr and diuron in a combination similar to the above-recommended rates for the tank mix. For Sahara DG®, the manufacturer (American Cyanamid) recommends an application rate as follows:

| Average Annual Rainfall (In inches) | Rate of Sahara DG® (Per acre) |
|--|----------------------------------|
| Less than 15 | 5-10 pounds |
| 15-35 | 6.5-13 pounds |
| Greater than 35 | 13-19 pounds |

For most of Western's service area, approximately 10 pounds of Sahara DG® per acre will provide control of most undesirable weeds.

The above recommendations are based on the amount of rainfall received in the specific area. When an application area receives more rain, a higher application rate is suggested by the herbicide manufacturer. A rule of thumb is that the less the rainfall, the longer the herbicide remains in the soil and prevents or prohibits plant growth. The length of time these herbicides may prevent vegetative growth varies by chemical and by factors such as dosage rate, target weed species, soil type, and rainfall.

Krovar I DF® (6-8 lbs.) + Oust® (3 oz.) -- This treatment is very effective at controlling heavy populations of annual weeds and grasses. Where sites have difficult-to-control weeds such as Russian thistle, kochia, certain grasses, and other problem weeds, use this mixture.

Oust® (3 oz.) + Karmex DF® (6 lbs.) + Roundup® (2qts.) -- A postemergence application which provides a clean, visibly straight treatment line. Apply when vegetation is approximately 2 - 4 inches tall.

Maintenance Treatment Programs (Second and Third years)

This program is used to maintain the initial treatment. Maintenance programs are lower in cost and provide good performance. If weeds begin to reenter this treatment, rotate back to the initial treatment program for one year. A yearly evaluation is encouraged to fine tune the herbicide rate and combination.

Krovar I DF® (6 lbs.) + Oust® (3 oz.) -- This combination provides consistent and effective weed control on moderate to heavy annual weed populations and light to moderate perennial weed populations. Very effective on Russian thistle and kochia. Do not apply where tree roots or desirable plants exist. Effective on ALS/AHAS resistant biotype weeds. This is a low cost treatment, ideal for maintenance programs.

Krovar I DF® (5 lbs.) + Karmex DF® (4 lbs.) + Oust® (1-2 oz.) -- This is a medium priced maintenance treatment. This tank mix combination results in excellent weed control.

Karmex DF® (6 lbs.) + Oust® (3 oz.) -- This combination will control light to moderate populations of annual weeds. This is a low cost treatment.

Krovar I DF® (5 lbs.) + Karmex DF® (5 lbs.) -- This combination is recommended for use around crop areas sensitive to other herbicides. It will control light to moderate populations of kochia, certain weeds and a few perennial weeds.

Weed Resistance

These multi-year programs will involve the rotation of herbicide products to achieve better control and best management practices to minimize off-site environmental impacts. Different herbicide products have different modes of action related to how they affect weed growth. When tank mixing herbicides with different modes of action, a broader spectrum of control is achieved. Biotypes of kochia, Russian thistle, and prickly lettuce that are resistant to ALS/AHAS products such as Arsenal® and Oust® have been identified in areas of the northern Great Plains and the Pacific Northwest. It is recommended that ALS/AHAS herbicides be used only in combination with other registered herbicides that have different modes of action and have similar soil residual activity. Do not let weed escapes go to seed; time postemergent treatments before seed formation. Respray problem areas in a timely and effective manner using a herbicide with a different mode of action.

Use of Oust®

It is important to be very selective with the use of Oust®. Most crops, particularly irrigated crops, are sensitive to Oust®. To reduce off-target risk, it is essential that great care be taken to apply Oust® only (1) where it will not physically drift during application; (2) where it will not be carried by surface water from treated areas; and (3) where Oust® treated soil will not be blown or otherwise be moved into cropland. Therefore, Oust® should only be used if it is being applied to a site in an isolated area which does not have crop or pasture land adjacent to it.

Postemergent Contact Herbicides

On occasion it will be necessary to add a postemergent contact herbicide to a tank mix of bare ground herbicides for a quick burn down, if weeds have already emerged from the ground. Postemergent contact herbicides have little or no residual soil activity, and therefore would need to be applied throughout the growing season. A very effective, nonselective postemergence herbicide is Roundup® (glyphosate, active ingredient). Any postemergent herbicide would have to be applied periodically to control weeds germinating throughout the growing season if no residual herbicides have been applied

in conjunction with the postemergent contact herbicides. Rainfall within six hours after application may reduce effectiveness. Complete control of weeds may require retreatment. The Rodeo® formulation is registered for aquatic sites.

Application Timing

There has been considerable debate over application timing in the spring or fall using bare ground herbicides. When evaluating the overall performance of bare ground residual herbicides, the following recommendations can be made.

The greatest performance consistency will be achieved when the timing is matched to your site.

Fall Applications Are Recommended (October - November) Prior to Freeze Up

1. When the rainfall is less than 15 inches per year.
2. Wind and temperature are more stable this time of year. Down time is reduced.
3. Winter rain and snow accumulation insure that the herbicide will be positioned into the soil below the plant's roots germinating in the spring. This insures herbicide uptake.
4. Fewer off-target complaints occur from fall applications because the product has had a chance to evenly disperse and bind in the soil with adequate moisture.
5. Herbicide degradation slows down significantly when soil temperatures reach 40 degrees Fahrenheit. The herbicide will remain stable and will not break down with these low soil temperatures.
6. Sensitive crops adjacent to treated areas will be harvested.

7. Commercial herbicide applicators are less busy during the fall, which would likely mean a lower bid for work.

Spring Applications Are Recommended (February - March) After the Winter Thaw

1. When the rainfall is greater than 15 inches per year.
2. When the herbicide is subject to breaking down in a warm, moist, open winter due to warmer soil temperatures.
3. When using postemergence, rescue treatments.

Check with the herbicide manufacturer's representative regarding optimal timing for best control.

Application Parameters

Sensitive Crops

During application, spray drift must be prevented to avoid off-target damage to desirable plants. The applicator should be knowledgeable of the chemical tolerance of adjacent vegetation, crops and ornamentals. Care should be taken with treatments which will interface (e.g., surface runoff or drift) with agricultural crops. Observing the weather conditions and limiting applications accordingly is very important. Additionally, the use of drift control agents such as Sta-Put® (Nalco Chemical Co.) or another proven drift control product will aid in reducing drift.

Spray Marking Dye

A spray marking dye should be added to the spray solution when liquid herbicides are being applied. The spray marking dye is a temporary colorant added to the spray solution for marking spray applications. Sunlight or rain will entirely fade the colorant in about 1.5 to 2 days. By adding a colorant to the spraying system, spray application contractors will be able to accurately and uniformly apply herbicides. In addition,

Western personnel will be able to observe where herbicides have and have not been applied to the surface of the graveled yard and outside the perimeter of the security fence. This makes inspection of contractor work by Western personnel much easier and more reliable.

Best Management Practice for Bare Ground Applications

When applying any bare ground herbicide there are always inherent risks that the chemical will move off-site with surface water runoff. To prevent future movement of herbicides from applications done at substations, yards and other facilities where bare ground control is desired, the following best management practices should be considered:

Climatic Conditions

The degree of pesticide leaching and transport in surface water at a particular site depends on the amount and nature (e.g., drizzle vs. downpour) of local precipitation events. These climatic factors are governed by the season and the geographical location. Runoff potential can be minimized by observing weather patterns and avoiding pesticide application before major precipitation events. In either situation, proper timing of herbicide application relative to climatic conditions involves knowledge or understanding of the period(s) of heavy precipitation for the geographical area in general. The immediate weather forecast, is, of course, of primary importance in making a specific application decision.

Application Perimeter Buffer Zone

It would be ideal if every Western substation or yard where bare ground control is desired had a 20 foot or wider buffer zone around it where migration of herbicide contaminated runoff could filter and breakdown, not impacting important crops or forage. Unfortunately this is not the case. But it is Western's job to minimize off-site impacts by minimizing drift and restricting weed control to 2 feet outside the security fence. On occasion, the ditches which collect and direct surface water runoff can act

as detention structures where vegetation is killed. Outside the security fence, vegetation should be mowed if possible.

Highly Sensitive Areas

In those areas where potential exists to damage sensitive crops, the herbicide glyphosate (Roundup®) should be considered. The use of Roundup®, however, will require multiple applications during the growing season since Roundup® is a postemergent contact herbicide. Consideration can be given to using Roundup® in a mix with Surflan A.S.® Or Pendulum WDG® to gain broader coverage and preemergent control.

7.4.5 Under Surfacing Materials Treatment

For weed control under asphalt and concrete surfaces, the herbicide Arsenal® is recommended at an application rate of 5 pints per acre. It is recommended that all vegetation and debris from the subgrade be removed prior to application. Treated areas should be paved as soon as possible after application.

The use of a **biological barrier** should also be considered under surfacing materials. Information on this control method is provided in Section 13.0.

7.5 PRE-APPLICATION PROCEDURES

The following checklist should be consulted before applying any herbicide.

PRE-APPLICATION CHECKLIST

1. Review Regulations

As discussed in Sections 2.1 and 2.2, some herbicides are restricted or designated for limited uses only either by Federal or State regulations. Table 7-1, Western's approved herbicide list, includes only Federal (EPA) - registered herbicides that are approved for ROW or other non-crop uses. However, State regulations can be more stringent, and it is important to **check any State restrictions**. These are found in Appendix A, along with phone numbers of state pesticide offices.

2. Review Property Owner Interagency Agreements

As Section 2.4 indicates, there are often specific agreements in place between Western and the property owner/land management agency. **Check for specific private landowner/interagency agreement restrictions** on use of herbicides or use of particular herbicides and/or application methods.

3. Review Site Conditions/Location

It is important to know your site conditions and match the specific herbicide/method to those conditions. **Check the following:** (a) the plants that are to be controlled; (b) the season of the year and associated limitations; (c) presence of sensitive environmental areas (e.g., endangered species habitat, wetlands, etc.); (d) presence/proximity of nontarget vegetation (e) vegetation conditions - height, amount of tall, growing brush, etc. Use the guidance provided in Table 7-2 and 4-5 to select the appropriate herbicide and method. Table 7-7 can aid in determining the correct application rate.

4. Review Western Environmental Protection Requirements (see Section 8.0).

Apply these along with the knowledge of site conditions/locations to ensure that appropriate procedures, buffers and precautionary measures are taken.

5. Read the label and follow the instructions/precautions!

7.6 WESTERN EMPLOYEE APPLICATION OF HERBICIDES

7.6.1 Certification and Training

The Federal Insecticide Fungicide, and Rodenticide Act (FIFRA) requires that anyone applying restricted use pesticides be trained and certified in pesticide application or under the direct supervision of a certified applicator. As a minimum requirement for certification, the applicator must show that he/she possesses a practical knowledge of the pest problems and pest control practices associated with operations, proper storage, use, handling and disposal of the pesticides and containers; and any related legal responsibility (40 CFR § 171.5). In addition, certified applicators acting in a supervisory role must demonstrate knowledge of Federal and State supervisory requirements.

Most States now administer their own certification programs and have developed their own standards of competency that are at least equal to the Federal requirements; in some cases, State requirements are more stringent. Applicators must successfully complete an EPA-approved training program and obtain a certificate with a certification number to meet FIFRA requirements for pesticide applicators. The certificate may be valid for up to 4 years, depending on State regulations. Thereafter, refresher courses or continuing education programs are required periodically for recertification.

An applicator certified in one State is not necessarily certified for all States. Applicators must refer to the regulations for each State for specific certification requirements.

7.6.2 Calibration of Equipment

Calibration is the process of measuring and adjusting the amount of herbicide your equipment will apply to the target area. Proper calibration is an essential but often neglected task. You need to be sure you are using the correct amount of herbicide.

Too little herbicide can result in inadequate control; too much can result in injury to the target plant, illegal residues, excess run-off or other movement from the target, injury to persons, pets or wildlife reentering the area, and lawsuits and fines.

Overdosing with herbicides is illegal and carries severe penalties. Another important consideration is the high cost of using the wrong dosage. You may have to repeat the entire application if insufficient control results from underdosing. With the high cost of chemicals, overdosing is very expensive. The key is to take time to calibrate your equipment carefully and correctly, then check it regularly to detect change due to wear, corrosion and aging.

Calibration does not have to be difficult. You must be familiar with the operation of the machinery you are using and follow the manufacturer's directions carefully. Pesticide labels give you much of the information you need in order to calibrate correctly.

Before you begin to calibrate any equipment, check it carefully to be sure that all components are clean and in good working order. Clean all lines and strainers, making sure all strainers are the correct size and properly placed. Check pressure gages against one known to be accurate. Check nozzles to be sure they are numbered alike. Check the flow from each nozzle. To check nozzle flow, collect the flow from each nozzle for 30 seconds into a calibrated container such as a measuring cup marked in ounces. Clean or replace nozzles when flow varies ± 5 percent from the average output of the nozzles. Nozzles should only be cleaned with a soft-bristled brush such as a toothbrush--never with a sharp or metal object.

Study the manufacturer's instructions carefully--they explain exactly how to adjust the equipment. They often contain suggestions on such things as the appropriate rate of travel, the range of most efficient pump pressures, approximate settings for achieving various delivery rates, and types of nozzles which can be used.

7.6.2.1 Pre-Calibration Decisions

Before beginning to calibrate, you need to develop an application strategy. Using your knowledge of the species to be controlled, the condition and location of the application site, the other control methods being used, and the risks and benefits involved, you must choose:

- The herbicide to be applied (see Section 7.3)
- The equipment used to apply it

These two factors are closely related. If you have a choice, select the formulation and equipment which are the least hazardous to you, other people, and the environment. In any situation, choose equipment which you feel competent to use, and which:

- Is designed for the type of chemical being applied
- Is appropriate for the size and type of application job

If the equipment you have chosen is not motorized, the calibration may be fairly simple. In fact, some equipment, such as aerosol cans and hand dusters, does not need any calibration. You are applying the correct dosage if you have covered the target completely. Other equipment of this type, such as granular spreaders for use on substations, needs to be calibrated only to adjust the delivery rate. This equipment delivers herbicides only when the wheels are in motion, and the speed doesn't affect the amount of chemicals being deposited per unit area.

If your equipment is motorized, you will need to determine the rate of speed best suited for the type of equipment and for the particular requirements of your application job. The equipment manufacturer's directions may offer a range of appropriate speeds. Your knowledge of factors such as field conditions and drift hazard, plus your experience with the equipment, will help you to determine an appropriate speed.

7.6.2.2 Calibrating Sprayers

Before You Calibrate

If the equipment you have chosen is spray equipment, you must determine three other factors in addition to the pre-calibration decisions in the preceding section:

- The appropriate pump pressure
- The spray volume needed
- The type of carrier to be used

Pump Pressure

Pump pressure is largely controlled by the type of equipment--particularly the type of pump--you have chosen. Each pump has a range of optimum pressures which it should provide. To protect the pump and to ensure steady pressure output, do not attempt to exceed or go under the working capacity.

Spray Volume

The label (or other spray recommendations) often lists the amount of spray volume needed for effective application. The spray volume is the amount of diluted herbicide mixture (herbicide plus carrier) to be applied per unit of area. The recommendation may be for a specific volume, such as 20 gallons per acre or 2 ½ gallons per 1,000 square feet. In other cases, a wide range of acceptable volumes may be listed; for example, “up to 400 gallons per acre,” or “15 to 40 gallons per acre.” You must choose the spray volume most appropriate for your spray job on the basis of your experience with the equipment and such factors as:

- The size of the spray tank
- The availability and cost of water or other carrier, such as kerosene or oil.
- The surface to be treated (dense foliage requires more volume)

Selecting Nozzle Tips

Nozzle manufacturers help applicators choose the right tip for each job by providing detailed charts of tip performance. The applicator matches the specific needs of the job to the “givens” on the chart to determine the tips and strainers to use.

The charts include the factors you must consider in order to choose appropriate nozzles--pressure, equipment speed, and spray volume. Charts which show spray volume in terms of both gallons per acre (gpa) and gallons per minute (gpm) allow you to choose your nozzles without further figuring.

Spray Gun Nozzles

Gun spraying is usually done by hand and is intended to wet surface thoroughly with spray material. In order to choose an appropriate spray gun nozzle, you must know the approximate operating pressure of your sprayer. Some guns are useful for pressures between 30 and 800 psi, but others are built only for pressures up to 200 psi or from 200 to 800 psi. The other variables are the spray angle which each nozzle delivers at various pressure settings and the maximum throw of each nozzle at different pressures.

You must decide which nozzle delivers spray at the appropriate angle and throw distances for your particular application job. Choose the tip according to the gallons per minute your sprayer will deliver and the pressure necessary to do the job. Nozzle capacities range from 0.25 gpm to 50 gpm at 30 to 800 psi, with throw distances up to 60 feet.

High Pressure (Hydraulic) Sprayer Calibration

High-pressure sprayers may be equipped with spray guns for treating livestock, orchards, nurseries, roadsides, or rights-of-way. Once the appropriate spray gun tip has been chosen and the flow rate has been checked, no further calibration is necessary. Flow rate may be checked by volume output.

Volume Output Method

Sometimes it is not practical to catch the flow from individual nozzles. Another method of calibration is to measure the volume of spray dispersed from the tank over a measured area. Your test area can be either one acre or part of an acre.

Spraying Less than One Acre: Another way to calibrate by the volume output method is to spray an area smaller than an acre:

1. Stake out a test area in the field to be sprayed. The distance should be at least 1,000 feet.

2. Fill the spray tank with water.
3. Spray the measured run using the pressure.
4. Refill the tank to the initial level, carefully measuring the quantity you add.
5. Calculate the rate of application.

To figure the gallons per acre for broadcast spraying:

Find the area sprayed in the test run:

$$\frac{\text{Sprayed width (in feet) x distance in test run (in feet)}}{43,560 \text{ (Square feet in one acre)}} = \text{Area sprayed (in acres)}$$

Then find the gallons per acre being sprayed:

$$\frac{\text{Gallons used in test run}}{\text{Area (in acres) sprayed in test run}} = \text{Gallons per acre}$$

Example:

- Sprayed width = 20 feet
- Distance in test run = 1,000 feet
- Gallons used in test run = 8
- Spray volume desired = 18 gpa

$$\frac{\text{Sprayed width (20') x test run (1,000)}}{43,560 \text{ sq. ft.}} = \text{Area sprayed (0.46 acre)}$$

$$\frac{\text{Gallons used (8)}}{\text{Area sprayed (0.46)}} = 17.4 \text{ gpa}$$

This is within 5% of the 18 gallons per acre you wish to spray.

7.6.2.3 Calibrating Granular Applicators & Dusters

General Application Equipment

There are many types of granular application equipment. Gravity-feed applicators may have one long hopper with a sliding gate or auger which regulates the flow to the multiple outlets.

In all types of granular equipment, the amount of granules applied per unit of area depends on the size of the adjustable opening, the speed at which the equipment travels (or the speed of the hopper agitator), the roughness of the surface of the application site, and the granular formulation chosen.

Different formulations have different flow rates depending on the size, weight, shape and texture of the granules. Granular equipment which is not motorized delivers granules at a rate geared to the turns on the hopper agitator, which is in turn geared to the revolutions of the wheels. The faster the equipment is moved, the faster the release of granules, and vice versa. As a result, equipment speed does not affect the amount of granules deposited per unit area. The only way to change the application rate in this type of equipment is by changing the feed gate settings.

Consult the equipment manual for manufacturer's recommendations for approximate settings for the granules being applied.

Calibrate your equipment using one of the methods described below. If the application rate differs more than 5% from the desired rate, you should adjust the equipment and recalibrate.

Broadcast Granular Applicators

Run a pre-calibration check on the equipment:

- First, fill the hopper to a predetermined height or weight. Settle the material by shaking or shrinking the hopper; then refill the hopper.
- Set the flow rate as recommended by the equipment manual.
- Turn on the applicator and operate on a hard surface to check for uniform distribution along the swath width.

The next step is to determine whether the equipment is metering granules at the rate per acre you need. Calibrate the equipment by determining the amount of granules distributed over a measured area.

Volume Output Method - Treat Less than an Acre

Stake out a test area in the field to be treated. The total test run should be at least 1,000 feet.

- Treat the test area at the speed and setting you have chosen.
- Catch the granules in a pan, or refill the hopper and measure the amount added.
- Calculate the rate of application:

$$\frac{\text{Swath width x distance in test run (in feet)}}{43,560 \text{ (Square feet in an acre)}} = \text{Area (in acres) treated in test}$$

$$\frac{\text{Pounds used in test run}}{\text{Area (in acres) treated in test run}} = \text{Pounds per acre}$$

Example:

- Swath width - 15 feet
- Test run - 1,000 feet
- Amount used in test run = 5 pounds
- Amount needed per acre = 15 pounds

Swath width (15') x test run (1,000') = Area treated (0.34 acre)

Square feet in an acre (43,560)

$$\frac{\text{Pounds used in test run (5)}}{\text{Area treated (0.34)}} = \text{Pounds per acre (14.7)}$$

That is within 5% of the specified rate.

Appendix H provides conversion tables that can be used to determine the amount of liquid or dry pesticide needed per unit area.

7.6.3 Pesticide Applicator Safety Requirements

The following safety requirements apply to all Western employees applying herbicides.

7.6.3.1 Handling of Pesticides (Mixing/Loading)

It is extremely important to follow label requirements pertaining to the use of safety equipment and clothing. Each job should be assessed for hazard - there may be occasions when common sense requires additional precautions to be taken even if not required by law. For more information, refer to WAPA Order 3790.1 and/or your Safety Office.

Pesticide poisoning of applicators or those associated with the application usually occurs from absorption through the skin. To avoid pesticides coming into contact with the skin, it is recommended that the minimum requirements shown on Figures 7-7 and 7-8 be followed.

Personal Protective Equipment (PPE) is designed to protect workers from various hazards. Use of PPE requires training and must be used according to its limitations, properly fitted, inspected, maintained, and disposed.

- **Coveralls** - Coveralls (or long-legged trousers and long-sleeved shirt) that cover the entire body from wrists to ankles will be worn at all times during handling and application. It is mandatory that these clothes be laundered often and they should be removed prior to going home. **Note: Pant legs and sleeves should be worn outside of boots or gloves.** Disposable or reusable coveralls are acceptable. Disposable coveralls are usually lightweight and more comfortable. If the operation will result in contact with heavy spray or mist, a waterproof suit should be worn. If liquid-proof clothing is required, it should be made of a tear-resistant plastic.
- **Gloves** - Chemical resistant gloves must be worn anytime pesticides are handled either during the mixing or loading operation or during hand application where prolonged exposure to spray or granules occurs. Unlined flexible plastic or neoprene gloves are the most desirable. Check the gloves for leaks prior to use, by filling with water and squeezing the glove. Do not use gloves that have cloth lining or wristband, or are made of leather, paper, or fabric.
- **Boots/Shoes and Socks** - When boots are required, unlined rubber boots which cover the ankles should be worn. Coverall legs should be worn outside the boots. Boots should be washed often. Do not use leather or fabric boots or shoes.
- **Goggles/Face Shield** - Goggles must be worn when pouring or mixing concentrates or anytime a harmful solution could contact the eyes through splash, spray, etc. Goggles should be the type that are non-fogging. Face shields should be made of clear plastic and be attached

to the hat so they can be raised and lowered. Do not use goggle headbands that can absorb the pesticide.

- **Hats** - A liquid-proof washable plastic hard hat should be worn by applicators during pesticide application and mixing operations as shown on Figures 7-7 and 7-8. Leather, fabric, or fiber hats and sweatbands should not be worn.

If respiratory devices or aprons are necessary, the following should be considered:

- **Aprons** - Aprons must be made of rubber or a synthetic liquid-proof material that will resist solvents. They should be long enough to cover the body from chest to boots.
- **Respiratory device** - The respirator must properly fit the face, so that air leakage does not occur - the user must be clean shaven. Use only equipment that is approved by the National Institute for Occupational Safety and Health or the Mining Enforcement and Safety Administration. The user must be adequately instructed in its use.

All equipment can be obtained from the Area Office Safety Manager or other approved sources. Designs range widely and it is important to avoid the undesirable constraints of some equipment. The wrong equipment can result in increased exposure over that of using no protective equipment.

The following additional rules should be followed when handling pesticides:

- Handle barrels and containers of chemicals or diesel oil with care to avoid personal injury. Avoid lifting them.
- Handle all pesticides in well ventilated areas.

- Immediately wash any contamination off the skin, with water or according to label instructions. Frequently wash during and after pesticide application, especially before eating or smoking.

The following actions are recommended for respirator use:

- Change cartridges after each 8-hour exposure, or more often if needed.
- Change filters every other day, or more often if needed.
- Thoroughly wash at each day's end.
- When handling fumigants, wear gas masks specifically approved for fumigant materials.

7.6.3.2 Safe Application

The following guidelines pertain to safety precautions to be taken during the actual application. It is important that sufficient planning precedes the application so that contract specification or instructions reflect these issues.

- Do not allow leaks in the spray distribution system or in the chemical mixing equipment. Keep equipment in good mechanical condition. Properly calibrate equipment prior to project start (see Section 7.6.2).
- Wear appropriate clothing as required for the type of chemical being used. Wash work clothing daily and change to clean clothing when not on duty. Cleanup is mandatory after each day's work. Coveralls should be furnished to those employees directly involved with spraying operations.
- Read the label on the chemical container and follow recommended safety practices. Do not use any chemical in a manner inconsistent with its label.

- Wash hands with soap and water immediately after contact with chemicals, and before smoking or handling food. Do not eat, drink, or smoke while using chemicals. Chemicals are absorbed through the skin more readily in the areas of the neck, wrists, and genitals.
- Select sites for loading, cleaning equipment and storage which will prevent contamination of streams, ponds, cisterns, food stocks, or crops adjacent to work area.
- Safely and appropriately dispose of empty chemical containers immediately after use.
- Do not work in direct spray drift.
- When working in high weeds, always go to the farthest point and work away from the area you are treating.
- Do not blow out clogged nozzles, hose, or lines with mouth.
- Never smoke, eat or drink while spraying or dusting.
- Avoid standing over the tank opening or downwind of materials when filling machines or mixing chemicals. When mixing concentrated liquids, use face shield.
- Never leave contaminated equipment or chemicals unattended.

7.6.4 Herbicide Storage Requirements

Federal Regulations (40 CFR Part 165) recommend specific procedures and criteria for the storage, monitoring and inventory of pesticides, pesticide containers and the equipment used for the application of pesticides. In addition, most States have regulations for the storage of pesticides, particularly for bulk storage. The regulations for each State should be reviewed for details of the State's requirements.

Face shield or goggles

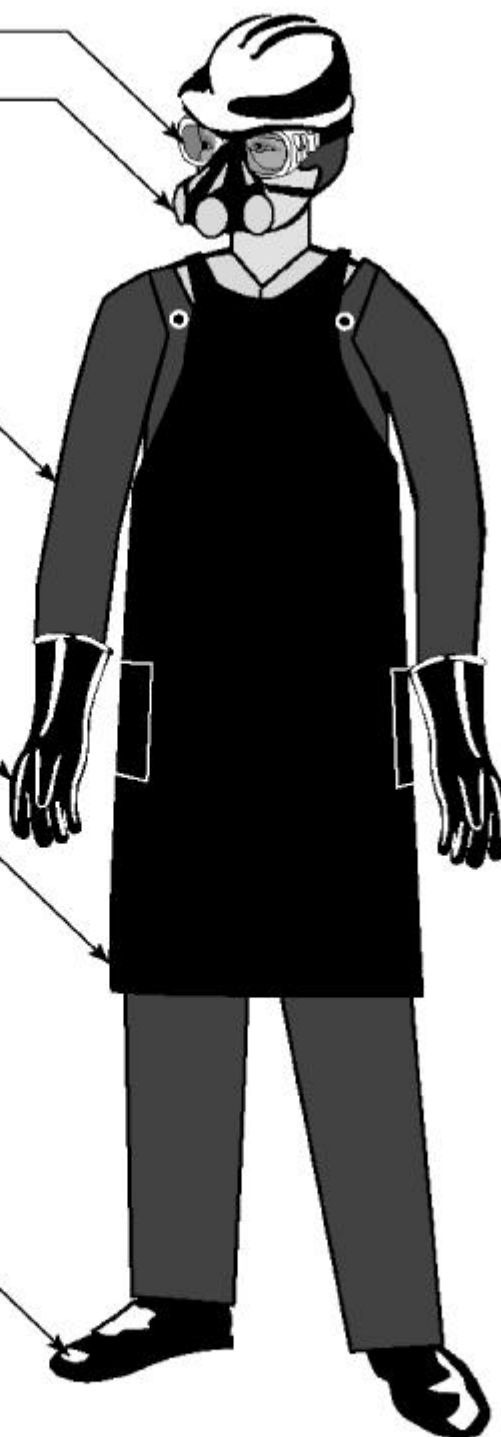
Respirator (If label
requires it)

Protective suit (such as
fabric coveralls) worn over
normal work cloths

Chemical-resistant gloves
such as rubber, vinyl
or plastic (never use fabric,
leather or paper gloves)

Chemical-resistant apron

Chemical-resistant boots
or footwear (never wear
leather or canvas footwear)



This is the minimum protective clothing and equipment you should wear while mixing and loading pesticides which are moderately to highly toxic.

Handling
Concentrates

Figure 7-7

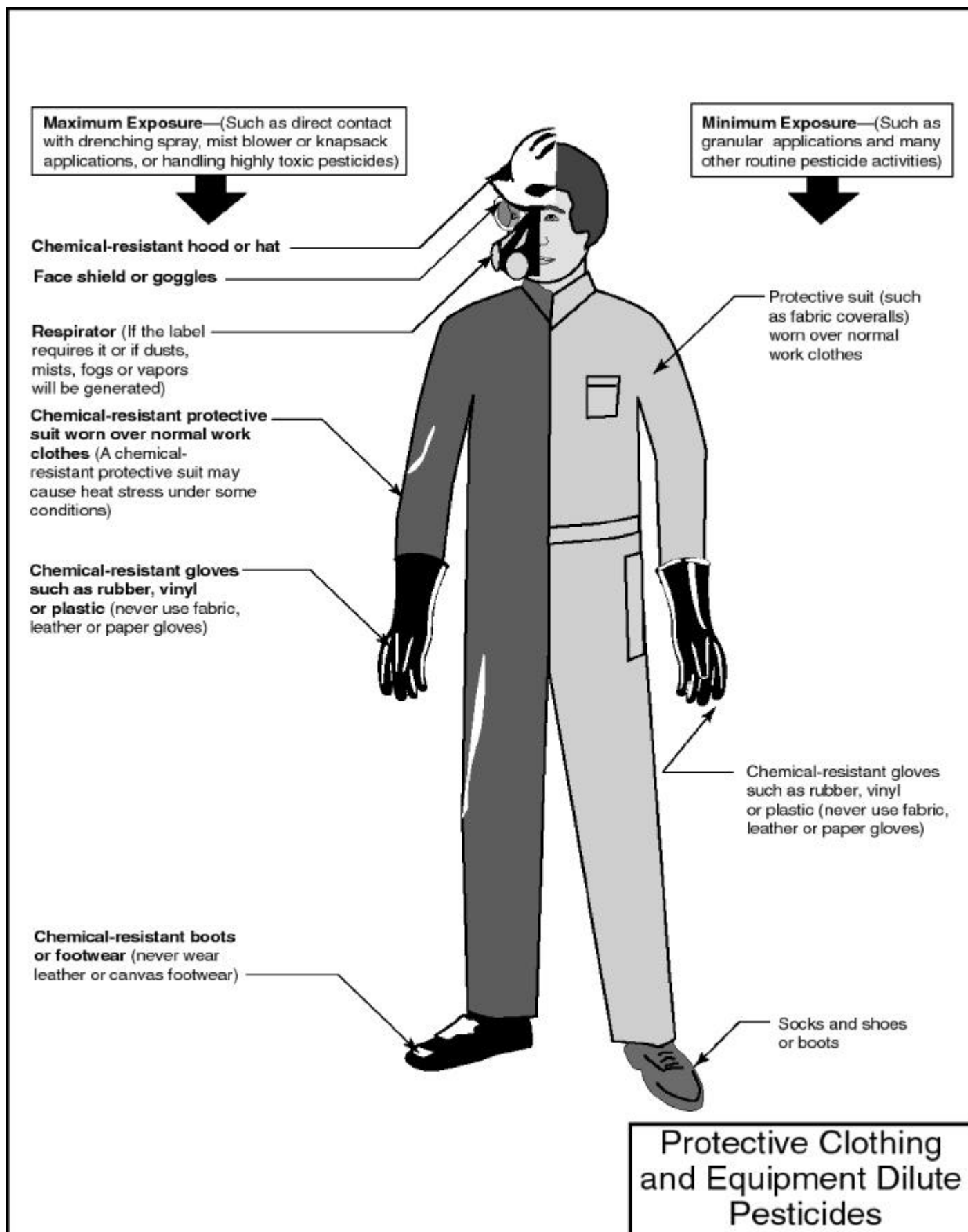


Figure 7-8

In general, the following storage guidelines should be followed to prevent an uncontrolled release of herbicides into the environment and to prevent any unnecessary exposure of workers and the public.

7.6.4.1 Storage Site Location

Storage sites should be selected with due regard to the amount, toxicity, and environmental hazard of herbicides, and the number and sizes of containers to be handled.

- Storage site areas should be located in a separate room, building or covered area where fire protection is provided.
- Storage sites should be located where flooding is unlikely, and at least 100 feet from any drainage ditch, well, or water body.
- Storage sites should not be located adjacent to or upslope from sensitive landscaping, gardening areas, croplands, feeders, or rangeland.
- Storage sites should not be located near fuel storage areas or other flammable materials.
- Storage sites should be located where there is easy access for emergency vehicles. Inform local police, fire department, and medical officials of the location and layout of the storage area and the types of materials stored.

7.6.4.2 Storage Facilities

- Pesticides should be stored in a dry, well-ventilated building.
- Storage facilities should be kept neat and clean, and free from chemical spills in and around the storage area.

- The entire storage facility should be secured with a fence, gate and/or doors that can be locked to prevent unauthorized entry.
- An all-purpose fire extinguisher must be kept in a readily accessible location and maintained for proper performance. All employees should be familiar with its operation.
- Herbicide storage areas should be identified at all points of entry with waterproof signs reading “PESTICIDE STORAGE AREA” and “NO SMOKING,” and if applicable “DANGER, POISON.” and “FLAMMABLE.”
- An area should be provided for decontamination of personnel and equipment. Where required, the decontamination area should be paved or lined with impervious materials. All contaminated water should be disposed of as an excess herbicide.
- Storage areas should maintain a current inventory of the number and type of herbicides in the storage building. This inventory should be updated on an annual basis to minimize the accumulation of unwanted and unused materials.

7.6.4.3 Operational Procedures

- All moveable equipment used for handling herbicides, which might be used for other purposes should be labeled “contaminated with pesticides” and should not be removed from the site unless thoroughly decontaminated.
- Store herbicide containers according to label instructions, in an upright position, off the ground, and with the label plainly visible. Dispose of unlabeled herbicides according to Federal, State, and local regulations.

- Containers should be checked regularly for corrosion and leaks. Replace damaged containers with like containers and attach a copy of the original label. Never use any type of food containers for storage of toxic chemicals.
- Materials such as adsorptive clay, hydrated lime, corncobs, and sodium hypochlorite should be kept on hand for emergency treatment of spills and leaks.
- Clean water supply for emergency wash up and rinsing should be available outside the storage building and during applications. At least 3 gallons of water, along with soap and paper towels should be available.
- Keep chemicals separated by type to prevent cross-contamination.
- Ensure that a portable or stationary eyewash station is readily available.
- Herbicide containers should be further segregated according to the method of disposal (see Section 7.6.7) to prevent accidental mixing during removal operations.
- Keep herbicide containers, particularly glass, away from windows and sunlight so they will not be subject to heat and ignition.
- Keep combustibles away from steamlines and heat (see label for information on flammability).
- Store empty containers in the secured storage area until proper disposal can be arranged (see Section 7.6.7).
- Never store herbicides next to food or feed intended for human or animal consumption.

- Use locked storage on all vehicles used in pest control operations and transportation of toxic materials (see Section 7.6.5).

7.6.4.4 Application Equipment

- Empty unused herbicide from equipment after each application. Return unused herbicide into its original container.
- Clean and properly maintain application equipment after each use.
- Never store personal protective equipment near herbicide material, especially protective eye wear, gloves, or respirator apparatus.

7.6.4.5 Bulk Storage of Pesticides

Many States now have additional requirements for secondary containment for storage of bulk pesticide containers. Bulk amounts are generally considered as:

- Individual containers exceeding 55 gallons liquid concentrate or 300 pounds dry concentrate.
- Total stored liquid concentrate exceeding 300 gallons or 3,000 pound dry concentrate.
- Total quantity handled exceeding 300 gallons liquid or 3,000 pounds dry per year or total quantity of active ingredients exceeds 1,500 pounds per year.

This can vary from State to State and individual State regulations should be verified. In general, States that require secondary containment for storage of bulk pesticides will specify capacity, allowable construction materials, and additional drainage and operational containment structures required for these facilities. Loading and mixing pads may also be required, and the facility may not be located near streams, rivers, wells, ditches or other bodies of water. Again, the regulations for each State should be reviewed prior to storing bulk quantities of pesticides.

The Superfund Act (CERCLA) and the Emergency Planning and Community Right-to-Know Act (SARA Title III) require annual chemical reporting about the presence of hazardous or Extremely Hazardous Substances (EHS) for any facility that uses or stores a hazardous substance or an EHS in quantities exceeding EPA or specific State quantity limits. Your Regional Environmental Specialist should be notified about any regulated bulk storage, so that the required reporting can be done.

7.6.4.6 Fire

If a fire should occur in a pesticide storage facility, the following actions should be taken:

- Evacuate and secure the area. Ensure that people maintain a safe distance in case of explosion.
- Call the Fire Department and ambulance.
- Inform fire-fighting personnel of the following:
 - (1) Type of chemicals contained in the facility and where they are located.
 - (2) Safety equipment that is required and possible poisoning if exposed to fumes or smoke without adequate protection.
- If necessary, a dike should be constructed to prevent run-off contamination and to contain overflow of burning liquid. This should be coordinated with emergency and spill crews.
- Rope off contaminated area and maintain it under continuous supervision until cleanup is completed.
- Do not smoke, drink or eat in the fire fighting vicinity, to avoid ingestion of toxic substances.

- Protect employees and nearby residents by assisting with evacuation of residents downwind of the fire, and requiring a medical check for those that may have been exposed.

7.6.5 Transportation of Pesticides

The Department of Transportation (DOT) regulations for the shipment of hazardous materials includes the following requirements that should be followed when transporting herbicides:

- Vehicles carrying greater than 1,000 pounds of hazardous materials should be placarded and labeled.
- Pesticides must not be transported in the same compartment with a person, food, or feed intended for human or animal consumption.
- Pesticides must be transported in a secure upright position with the opening closed or sealed with lids or bungs tight.
- All containers must have either the original product label or a secure container label with the name of the pesticide and the signal word from the original container, and the name and address of the person responsible for the container.
- Drivers and handlers of pesticides must be trained on the proper handling and identification of hazardous materials.
- Pesticides should not be left either unattended or in an unlocked vehicle either at the batching site or en route to or from the batching site.
- Spills or leaks during shipment should be cleaned up immediately as described in Section 7.6.6.

- A contaminated vehicle should not be used for any purpose until it can be completely decontaminated. Until the vehicle is cleaned, it should be locked and isolated so that no unauthorized person can come in contact with the hazardous material.

7.6.6 Spill Cleanup Procedures

All reasonable precautions should be taken to avoid spilling herbicides; however, should an accident occur, immediate action is required. A quick and effective response is necessary to minimize effects on employees, the public, and the environment. The following guidelines can minimize these impacts.

7.6.6.1 Minor Spills

Minor spills will be the most common type of spill. When such spills occur, if at all possible, mix the spilled herbicide into soil or other absorbent material and spread it over areas where specific vegetation control is required at a rate equivalent to the label rate. If the spill occurs away from the application area (e.g., at a storage area), then proceed with the containment, notification, cleanup, decontamination and disposal procedures listed under Section 7.6.6.2.

7.6.6.2 Major Spills

A spill will be considered major if it has the potential to affect human health and/or:

- A spill of any quantity of mixed or undiluted herbicide directly into a water course or in the proximity of a water course where the herbicide might easily reach the water.
- A spill of five gallons or more of undiluted herbicide or five pounds of pellets, granules, or powders which cannot be recovered on or off the right-of-way, substation, or other facility.

- A spill of more than 50 gallons of herbicide mix on or off the right-of-way, substation or other facility.
- A spill where none of the herbicide can be recovered.
- A spill in a sensitive area such as where:
 - Highly sensitive crops are present, such as grapes, beans, potatoes, tomatoes.
 - Water is being used for domestic purposes, fish hatcheries, irrigation, etc.
 - Adjacent to any water source or an area where the water table is high.
- A spill which must be reported to the National Response Center (see Table 7-8).

TABLE 7-8
HERBICIDES QUALIFYING AS HAZARDOUS SUBSTANCES

Notify the National Response Center (Toll Free: 800-424-8802) if any of the following herbicides in the amounts in the right hand column or greater are spilled. Additional packaging, labeling, storage, transportation and disposal procedures are required for 2,4-D because it is also a hazardous waste under federal regulations; check other states (Appendix I contacts) for additional hazardous wastes listings; see also Herbicide Disposal (Section 7.6.7).

| Reportable Pesticide | Quantities in lbs. of Active Ingredients |
|--|---|
| 2,4-D (Acids, Salts, or Esters; various names) | 100 |
| Diglycolamine Salt of Dicamba (Vanquish®) | 1,000 |
| Diuron (Karmex®, Krovar®, etc.) | 100 |

The steps below are generalized procedures which should be adapted to various spill situations. Specific actions to be taken for each of these 6 steps are discussed below. If the spill is a major spill, steps 4-6 may be conducted by an outside waste removal contractor. This will be decided when notification is given in Step 3.

1. Take care of injured.
2. Contain spill.
3. Notify appropriate individuals/agencies.
4. Clean up spill.
5. Decontaminate area and equipment.
6. Dispose of spilled material.

Always refer to the Material Safety Data Sheets (MSDS's) for detailed information about the chemical and how to treat those who have come in contact with it, what PPE to use, etc.

1. **Take Care of Injured**

- **Medical Emergencies**

- First Aid - Pesticide manufacturers and medical personnel are the two best sources of information on how to help victims exposed to herbicides. Herbicide labels and MSDS's may note specific information on what to do for first aid and medical emergencies.

The following tips may be useful should emergency pesticide exposure occur:

- REMAIN CALM.
- AVOID CONTAMINATING YOURSELF WHEN HELPING THE VICTIM.

- INFORM MEDICAL PERSONNEL OF THE NAME OF THE HERBICIDES INVOLVED.
- IF POSSIBLE, SEND COPIES OF THE LABEL AND MSDS WITH THE VICTIM TO THE HOSPITAL.

Some basic first aid steps include:

- If skin is contaminated, wash the victim with clean water. Wear gloves and other necessary PPE.
 - Remove contaminated clothes and loosen other clothing.
 - Eyes should be washed with clean water for a minimum of 15 minutes while holding the victim's eyelids open.
 - If the herbicide is ingested, check with the label and physician to see if vomiting should be induced. Vomiting should only be induced if the pesticide was taken by mouth, the person is fully conscious, and the pesticide is not corrosive.
 - If the herbicide is airborne, protect yourself with an approved respirator before entering the contaminated area.
 - Get the victim to fresh air as soon as possible.
- Resources - The specific manufacturer is the best resource when it comes to medical emergency information. Often the manufacturer will list a 24 hour emergency number on the label or MSDS.

2. **Contain Spill**

Spilled herbicide must be contained to facilitate clean-up and prevent the herbicide from further contaminating the environment. Follow these procedures:

- Wear protective clothing according to label instructions. Rubber or neoprene gloves, rain suits and rubber boots may be used when appropriate.
- Prevent further leakage by repositioning container and sealing with rags, tape or other material at hand.
- Cover the spill with an absorbent material if the spill is liquid; absorbent materials include clay-type cat litters, sawdust, etc. If the spill is a dry chemical, cover it with a plastic tarpaulin and secure.
- Prevent ignition of flammable materials by eliminating sources of ignition; for example, exhausts, electric motors, gasoline engines, etc.
- **DO NOT** flush the spill into a ditch, sewer, drain or off the road, since this further spreads the spill.

3. **Notify Appropriate Individual/Agencies**

Minor Spills

Western Regional
Environmental Manager

Major Spills

Western Regional Environmental Manager
and Western CSO-Office of Environment,
who will then notify the following:

- National Response Center (800-424-8802)
- DOE Unusual Occurrence Office
- State Agencies (see Appendix I)
- Land Owner
- Safety Office

4. **Clean Up Spill**

Spill clean-up is necessary to remove potential hazard. Because herbicides can liberate toxic fumes or vapors, always work in a well ventilated area. Open enclosed areas to prevent the accumulation of toxic fumes while working. **NEVER WORK ALONE!** Always maintain eye contact with a work partner. If additional information about emergency spill clean-up is necessary, contact CHEMTREC (Chemical Transportation Emergency Center - phone 800-424-9300).

- **Dry Spills**

Immediately cover powders or dusts with plastic or a tarpaulin to prevent the pesticide materials from becoming airborne.

- Clean up by rolling the tarp back little by little as you sweep.
- Shovel the material into a plastic bag or drum.
- Seal the bags or drums and identify the pesticide.

- If necessary, set the bags or drums aside for subsequent disposal.

- **Liquid Spills**

- Use absorbent materials such as commercially bagged clay or cat litter to soak up the spill.
- Spread the absorbent material around the perimeter of the spill and sweep toward the center.
- Shovel the absorbent and pesticide into leak-proof container(s) for subsequent disposal.
- Label the containers.

5. **Decontamination**

The small amount of herbicide remaining after the clean-up process (on the road surface, storage area floor, or non-porous truck bed) must be decontaminated or neutralized. Nutra-Sol Equipment Cleaner (standard size container - 2 lb.) may not totally inactivate or detoxify the herbicide, but will react with it to form a less toxic or less mobile compound and may be used in place of a decontamination solution.

- **Soil**

Contaminated soil should be removed to a depth of at least two inches below the contaminated zone and placed in drums for disposal. Activated charcoal may be spread to further absorb and dilute remaining herbicide residues.

- **Roadways, Floors and other Non-porous Surfaces**

- Spread the appropriate decontamination agent on the spill and work it into the surface using a coarse broom or scrub brush. Allow the decontaminant to soak for two hours.
- Pick up the decontamination material by spreading fresh absorbent material around the perimeter of the spill area, sweeping it toward the center, and shoveling it into plastic bags or drums.
- Repeat the decontamination and clean-up process.

- **Tool and Vehicles**

- Before removing any vehicles involved with the spill, a decontamination solution should be used to clean all contaminated parts that might be exposed to the public or other employees. Nutra-Sol Equipment Cleaner may be used in place of a decontamination solution (standard size container - 2 lb.).
- Apply the appropriate decontamination solution to all tools and equipment. Allow to soak for two hours. Rinse with a sparing amount of water. Then wash the tools and equipment with detergent and water. The rinse solution should be collected for subsequent disposal.

- **Wood and Other Porous Materials**

Discard or destroy porous material and equipment such as brooms or leather shoes. These cannot effectively be decontaminated.

- **Protective Equipment**

All equipment should be scrubbed in a strong detergent solution, rinsed and dried before putting away for reuse. Discard any equipment that is grossly contaminated or that can't be decontaminated.

- **Personnel**

All personnel should decontaminate themselves with detergent and lots of water. Inner clothing should be washed with strong detergent separately from other household laundry.

6. **Disposal**

Disposal of herbicide and herbicide spill residues should be done in accordance with the procedures found in Section 7.6.7.

7.6.7 Disposal

Disposal of containers and excess material or debris from spills is regulated by the Environmental Protection Agency (EPA) and by various State and county agencies within Western's service area. In addition, some types of excess herbicides, some types of contaminated herbicides, and spill clean-up materials must be disposed of as hazardous waste.

7.6.7.1 Action

Check Appendix A for State-specific disposal requirements. Unless otherwise specified in State or local regulations, dispose of excess herbicides, herbicide containers, or spill clean-up materials in the following manner:

- **Liquid Herbicide Containers:** Triple rinse all containers for liquid herbicides and add rinse solution to spray tank mix. Each rinse solution should be equal to at least 1/4 of the container volume if the container is

5 gallons or less, and 1/5 the container volume if the container is over 5 gallons. Empty, triple-rinsed containers should be punctured or crushed and disposed of in a sanitary landfill or approved disposal site. Because the status of various landfills may change, check with the landfill operator prior to disposal. Contact the Regional Environmental Manager if there are questions or problems with local disposal sites.

- **Dry Herbicide Containers:** Paper and carton-type containers should be thoroughly emptied. Tear/cut open bags or boxes and shake out into spray tank. For fiber drums and large containers, strike or hit the container three times over working solution to dislodge dry herbicide; triple-rinse containers with plastic or foil liners if herbicide is formulated to be mixed in a liquid solution. Dispose of at a sanitary landfill or disposal site as above.
- **Contaminated Materials from Spills:** Debris resulting from spills must be disposed of as if it were the herbicide itself. Disposal should be at a designated disposal site.

7.6.7.2 Hazardous Waste Disposal

Some herbicides are subject to regulation as hazardous waste if large amounts are spilled or are to be otherwise discarded. State and federal regulations should be checked to determine if you are dealing with a hazardous waste. Contact the Regional Environmental Manager to determine if the herbicide qualifies as a hazardous waste, and call the State hazardous waste agency listed in Appendix I to determine if more stringent State requirements exist. Additional packaging, labeling, storage, transportation, reporting, and disposal procedures will be required. Western personnel who apply pesticides may contact their Regional Environmental Manager for hazardous waste procedures for specific cases.

7.6.8 Recordkeeping Requirements

All applicators for Western, including contractors, shall complete an application record form for all herbicide applications. An example form is provided as Appendix J and includes the following:

- The legal description of the location of the land or the property where the herbicide was applied.
- The acreage, area or number of plants treated or other appropriate description.
- The year, month, day, and time the herbicide was applied.
- The name, certification number, and signature of the applicator.
- The company name appearing on the label (together with the EPA pesticide registration number and product lot number from the labels). Include name and manufacturer of any spray marking dye or drift control agents used.
- The weather conditions at the time of the application; including the direction and estimated velocity of the wind, rainfall, humidity and the temperature at the time the herbicide was applied.
- Amount of the herbicide applied and concentration in pounds or gallons per unit or percentages of active ingredient per unit of the pesticide used.
- Method of application (equipment used, carrier).

- Specific vegetation, weed, or designated site to which pesticide application was made.
- Any problems associated with the application of the herbicide.

Pesticide application records shall be completed at the close of each day, and shall be kept at the facility where pesticides and application equipment are stored for three years from the date of the application of any pesticides. Some States require an annual written summary of these records before renewing the applicators license or certification.

7.7 CONTRACTOR VEGETATION MANAGEMENT SERVICES

This section briefly presents Western's policy for employing a contractor for application of herbicides, mechanical or biological methods for vegetation management which include an example Request for Proposal (RFP) and a Statement of Work (see Appendixes K and L).

7.7.1 Request for Proposal

The RFP is a request for bids from contractors for a specific vegetation management service. The RFP briefly describes the scope of work and the objectives of the program, and the criteria for selecting a contractor. This approach to bidding is to provide qualified contractors with a minimal description of the job requirements, including a description of all sites to be treated and preferred treatment methods, if desired. The contractor then submits a proposal of specific treatments and treatment schedules by site. The proposals must be evaluated and then compared for cost-effectiveness. This RFP procedure helps ensure that the contractor visits and evaluates the sites, thus minimizing the likelihood of unrealistically low bids or contract default due to inadequate assessment of job requirements. It also gives the contractor an opportunity to demonstrate his knowledge about long-term weed control and provides incentives for developing more efficient weed control strategies. This approach requires considerable expertise on the part of the contract administrator to develop criteria, evaluate proposals, and compare cost-effectiveness. Appendix K

provides an example RFP for use in soliciting bids, which includes example evaluation criteria.

7.7.2 Statement of Work

The Statement of Work (SOW) provides the contractor with details of Western's requirements for the contractor's performance of vegetative management services. The SOW includes the purpose and scope of the program, the contractor's responsibilities, Western's responsibilities, and a schedule for completion of this work. Appendix L provides an example SOW written for Western Colorado Maintenance Office. If herbicides are to be used it should be noted within the SOW that the contractor will apply them in accordance with all Federal, State and local requirements, as well as Western's IVMP policies and standards. Only Western-approved herbicides may be used.

7.7.3 Western Inspection of Work

At substations, Western will provide a qualified safety or maintenance inspector for all work, who will maintain direct control over movement of Contractor personnel and equipment. The on-site safety inspector will approve access to any restricted areas within the energized facility. On rights-of-way, Western maintenance personnel will provide control/inspection for all Contractor work.

7.7.4 Western Recordkeeping

Contractors are required to submit the following information to Western when applying herbicides:

1. Date of application.
2. Place (facility) and size of area (square feet or acreage) treated.
3. Name and manufacturer of herbicide applied, together with the EPA pesticide registration number and product lot number from the labels.

Include name and manufacturer of spray marking dye and any drift control agents used.

4. Method of application (equipment used, carrier).
5. Weather conditions at time of application (wind speed, wind direction, temperature, rainfall, and humidity).
6. Quantity/rate of herbicide applied (pounds of active ingredient per acre of quantity of product per acre).
7. Any problems associated with the application of herbicides.
8. Other information/data as required by applicable Federal and State regulations.

WESTERN ENVIRONMENTAL PROTECTION REQUIREMENTS

Hazards to the atmosphere, soil, or water in the environment from herbicides occur as a result of misapplication and misuse of these chemicals. **Damage from herbicides as a result of misapplication is due either to (1) lack of understanding of how to safely and effectively apply herbicides, or (2) lack of concern or disregard for other private or public property.** To help avoid more restrictive regulations in the use of herbicides, apply and use each herbicide according to all directions, warnings, and precautions on the herbicide label, and encourage other users to do the same.

The following environmental standards and procedures are relevant to all methods of vegetation control in Western's service area. These measures should be looked upon as means to avoid or minimize environmental impacts of vegetation control, thereby mitigating the effects of the various control procedures. Table 4-5 also addresses environmental concerns and provides notes on use limitations that help prevent environmental impacts.

1. **Comply** with all applicable Federal and State **laws and regulations, and interagency agreements**, in conducting vegetation management treatments.
2. **Select treatments** for specific sites **based on** considerations of sociological, economic, and ecological consequences; that is, use an **IVM** decisionmaking process.
3. **Strictly observe herbicide application rates, application techniques, and restrictions** as specified on EPA-approved label instructions; use pressures as low as possible, less volatile or low-drift formulations. For **Phenoxy Herbicides**, use amine salt formulation if possible and if temperatures are expected to exceed 80°F. If ester formulations must be used, apply low-volatile ester formulations when air temperatures are expected to be below 85°F for several hours. High volatile ester formulations of 2, 4-D release vapors or fumes rapidly at about 80°F; low volatile ester formulations at about 90°F.

4. **Use licensed herbicide applicators** exclusively as specified by State law.
5. Strictly observe application **buffer zones around water bodies** -- streams, lakes, ponds, and wetlands. See Table 8-1 for what buffers should be observed during herbicide application.

TABLE 8-1
HERBICIDE APPLICATION BUFFERS NEAR WATER BODIES

| Herbicide Application Method | Water Buffer Width |
|------------------------------|--------------------|
| Foliage Spray | 50 feet |
| Basal Spray | 10 feet |
| Stump Treatment | 10 feet |
| Soil Treatment - Pellets | 10 feet |

6. **Observe wind and weather limitations** for herbicide applications to minimize drift and runoff. **Apply chemicals when wind is calm** or when a light breeze is blowing away from non-target plants. **Spray drift from 2, 4-D can injure susceptible plants further than 6 or 7 miles away.** See Table 8-2 for a summary of weather-related restrictions for herbicides applications. Use drift control agents (if necessary) to avoid hazard of damage to nearby plants.

TABLE 8-2
WEATHER SUMMARY - RESTRICTIONS FOR HERBICIDE APPLICATIONS

| Control Method | Max. Temp | Minimum Humidity | Precip. | Wind | Season |
|--------------------------|-----------|------------------|--------------|----------|----------------------------|
| Foliar Spray | 75° | 30% | None | 0-5 MPH | Spring/Summer ³ |
| Stump Treatment | -- | -- | Minimal | -- | Frost Free ¹ |
| Pellet/Soil Applications | -- | -- | ² | -- | Frost Free ¹ |
| Basal Spray | 75° | 30% | Minimal | 0-10 MPH | Frost Free ¹ |

¹ Wood must not be frozen to permit penetration.

² Moderate precipitation required to move chemical in soil.

³ Or as specified on herbicide label.

Source: BPA 1994a.

7. **Prevent groundwater and surface water contamination by using preventative measures.** Recognize that the greatest vulnerability from herbicides occurs with the following conditions:
 - **Herbicide** - highly soluble; low soil absorption; persistent.
 - **Soil** - permeable - sandy, gravel, low organic matter.
 - **Site** - shallow groundwater, nearby surface water, wet climate, floodplain.
 - **Management** - high rate or frequency of application, soil-applied herbicide, application before heavy rain.
8. **Monitor** herbicide residues and soil and water; monitor the fate of herbicides (in groundwater and surface water) used as high allocation rates for substation weed control.
9. **Strictly observe all laws and regulations governing herbicide handling, storage, and disposal and spill cleanup.**
10. Observe buffers/reduce disturbance if **endangered/threatened/rare species** are likely; check label restrictions.
11. **Research** continually into new vegetation control methods and documentation of study designs and results.
12. **Train herbicide applicators** to ensure proper application rates and herbicide placement are used; **inspect herbicide operations** to ensure proper implementation.

Monitoring is necessary to identify situations where management actions are needed, to evaluate the effectiveness of vegetation control methods used, and to monitor the effectiveness of new herbicides or new treatment methods. Regardless of the method used, whether it is mechanical, biological or chemical, monitoring should be performed to verify that Western's Integrated Vegetation Management Program (IVMP) is producing the desired results to ensure the reliable operation of Western's electric transmission system. An effective monitoring program will include:

- Clear delegation of responsibility for monitoring reports
- Delineation of clear vegetation growth management objectives
- Maintenance schedules which are consistent with vegetation growth cycles and vegetation control management activities
- Provisions for groundwater and surface water monitoring
- Guidelines for processing information and feedback

The following re-state the basic objectives of Western's IVMP. In evaluating the performance of any vegetation control method, it should be noted whether or not the method helped to achieve each of these objectives.

1. Protect public and worker safety.
2. Prevent operational hazards, such as tall-growing trees on transmission line rights-of-way.
3. Maintain unimpaired access to transmission facilities and rights of way.
4. Protect substations, switchyards, and microwave stations from fire hazards.
5. Control the spread of noxious weeds in compliance with State and county regulations.
6. Manage vegetation growth in a technical and efficient manner.

7. Protect environmental quality of water, wildlife and aesthetic resources.
8. Establish stable, low-growing plant communities on transmission line rights-of-way.
9. Use integrated vegetation management methods to meet objectives.

Regarding water quality monitoring, a Groundwater Management Program is being implemented, and a Groundwater Monitoring Plan was completed in 1994.

CONDUCTOR CLEARING REQUIREMENTS

Line voltage determines the conductor clearing requirements within the transmission line right-of-way. In addition, there are areas that are more sensitive due to environmental or visual characteristics that require modified clearing. **For Western's service area, the basic clearing requirements for rights-of-way have been developed based on safety, service reliability, and line voltages. These are presented in Table 10-1.**

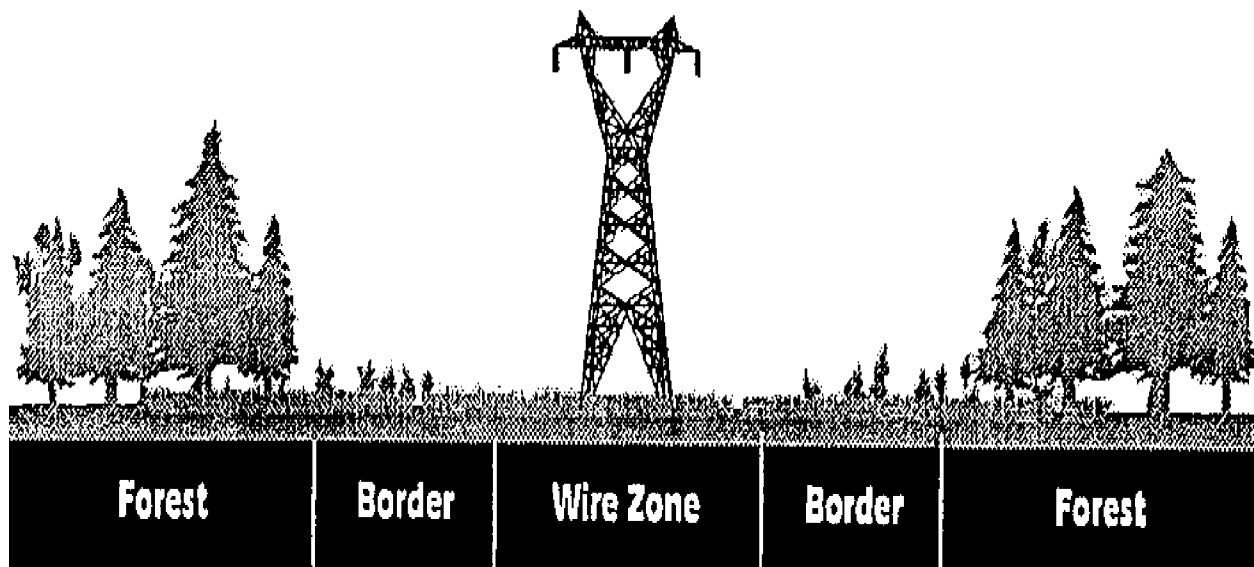
Clearing of the entire right-of-way to the same extent is neither necessarily required nor desirable. Meeting the minimum conductor clearances presented on Table 10-1 means that the right-of-way really becomes two zones:

- A **wire zone**, immediately under the conductors - most vegetation here will be limited to low shrubs, herbs, and grasses; all trees and tall shrubs will be removed.
- Two **border zones** on each either side of the wire zone, where a tall shrub/low shrub/herb-grass cover will develop - only tall-growing tree species are removed.

Figure 10-1 illustrates the desired effect from this type of selective vegetation control within the two zones.

There are several special cases where more limited vegetation clearing may be desirable within the transmission right-of-way. Proximity to restricted or sensitive areas may affect the vegetation control method used. Areas such as stream buffers, ravines, and visually sensitive areas may require less intensive clearing or restricted use of herbicides. The clearing requirements for these areas will vary, depending on the nature of the vegetation present, the agreement with the property owner, and topography. Generally, control of the tall-growing species will be limited as follows:

- **Ravines** - Clearing or treatment of vegetation is unnecessary where it will never violate the required conductor clearances. The topography and vegetation type will determine whether any clearing at all is necessary.



WIRE-BORDER VEGETATION ZONE MAINTENANCE

Consists of dividing the rights-of-way (ROW) into two zones:

- ▶ A wire zone - ROW area under the conductors
- ▶ Two border zones - ROW area on both sides of the wire zone

Boundaries of these zones are not marked in the field because irregular boundaries are considered desirable as long as wire zone is complete treated

**WIRE-BORDER VEGETATION
ZONE MAINTENANCE**

FIG. 10-1

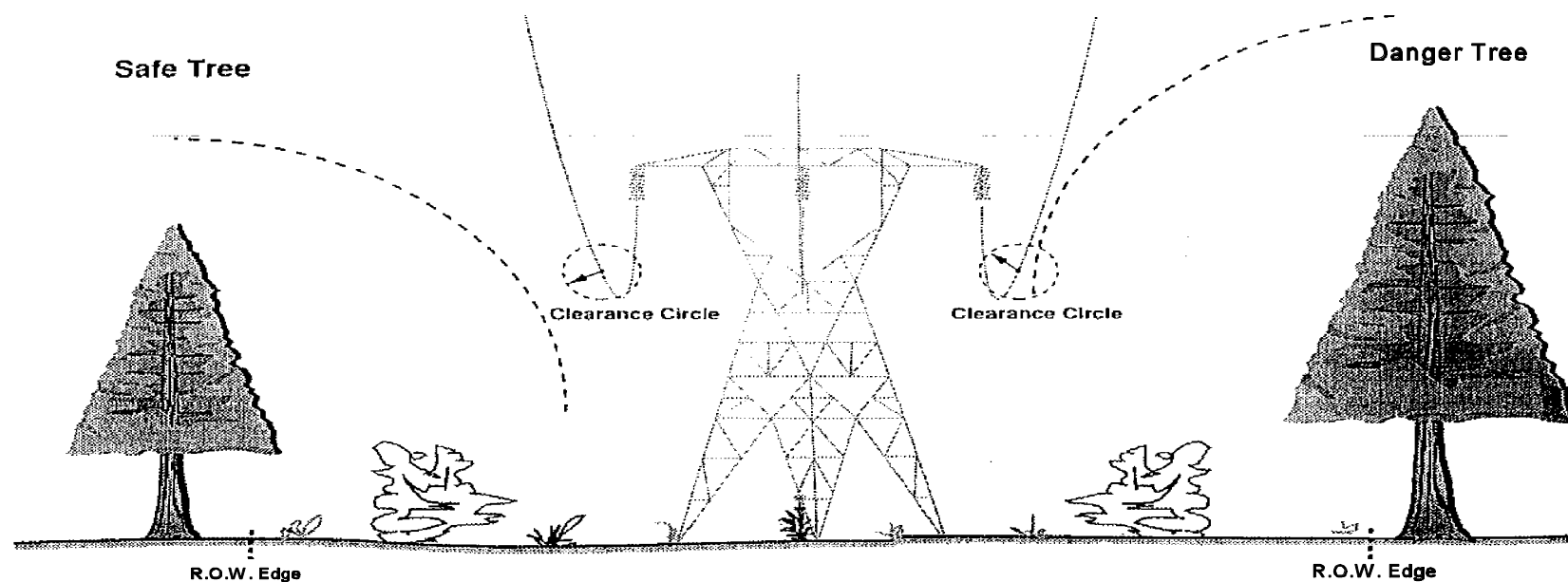
TABLE 10-1
TRANSMISSION LINE ROW CLEARING REQUIREMENTS

| Line Voltage | General ROW Width | Minimum Clearance Between Conductor and Vegetation |
|--------------|-------------------|--|
| 69 kV | 75' | 15' |
| 115 kV | 80' | 15'8" |
| 138 kV | 80' | 16'4" |
| 161 kV | 100' | 16'8" |
| 230 kV | 125'-150' | 18' |
| 345 kV | 150'-175' | 20'4" |
| 500 kV | 200' | 24' |

Note:

Older transmission lines may have ROW agreements specifying different widths. In all cases, the clearances obtained shall be such that the vegetation will not encroach on the minimum clearances listed above before the next scheduled maintenance cycle.

- **Stream Crossings/Buffers** - More vegetation should be left within 50 feet of a stream to preserve the existing water quality; herbicide use may be limited. In such areas where tall growing vegetation would encroach within the danger zone of the conductor, trimming or topping may be necessary if safe access is available.
- **Road Screens** - More vegetation should be left within 50 feet of a road that has a visually sensitive crossing; there is also the possibility of limiting foliage herbicide applications that result in "brownout." Tree trimming or topping may be effective in such areas.
- **Danger trees** are those trees that are located within or adjacent to the easement or permit area that present an immediate hazard to the facility or have the potential to encroach with the safe distance to the conductor as a result of bending, growing, swinging, or falling toward the conductor. In all cases, the clearances obtained shall be such that the vegetation will not encroach on the minimum clearances listed on Figures 10-2 through 10-5 before the next maintenance cycle. Danger trees fall into one of the following five types:
 - **Fall-into trees** are unstable trees that, if they were allowed to fall toward the transmission line, would extend into the minimum safe distance to the conductor. These trees include, but are not limited to, trees that are diseased, dead, structurally damaged, leaners, subject to wind-throw, undercut, or have damaged or eroded root systems (Figure 10-2).
 - **Bend-into trees** are trees located off and adjacent to the right-of-way which have tops or branches that bend down or could bend down into the minimum safety distance to the power line conductor (Figure 10-3). These trees can be identified by assuming an imaginary vertical plane parallel to the conductor at the distance specified in Figure 10-3 and extending upward indefinitely.
 - **Grow-into trees** are trees located in and/or adjacent to the right-of-way which have branches that have grown or will grow horizontally and vertically into the minimum safety distance to the conductor (see Figure 10-4).



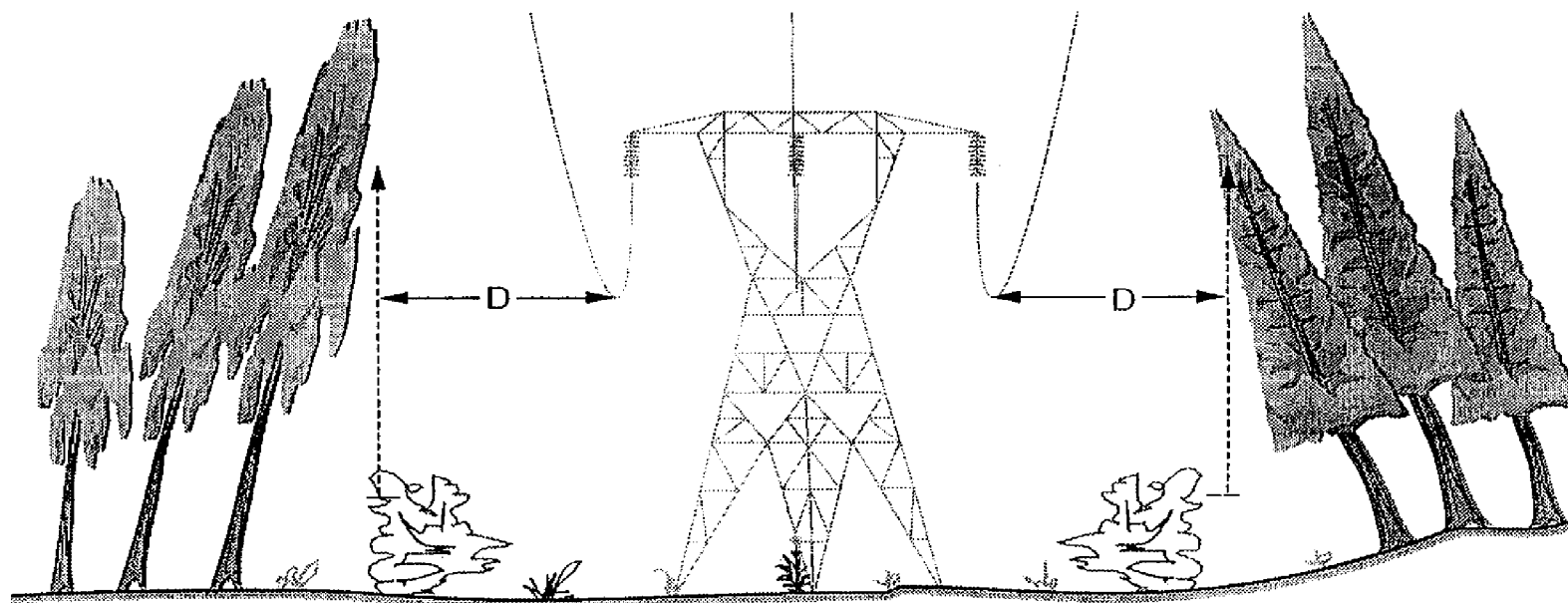
Scenario:
Unstable DANGER TREES falling toward the conductor.

Unstable TREES with growth added, that when falling would reach into the Clearance Circle will be removed.

Conductor at maximum sag and in a static position.

**FALL-INTO
DANGER TREES**
ADAPTED FROM BPA 1985

FIG. 10-2

**Scenario:**

Snow load, wind, or other factors causing tops or branches of **DANGER TREES**, off R.O.W., to bend into the Safety Zone.

Snow load, wind, or other factors causing tops or branches of **BRUSH**, on R.O.W., to bend into the Safety Zone.

Notes:

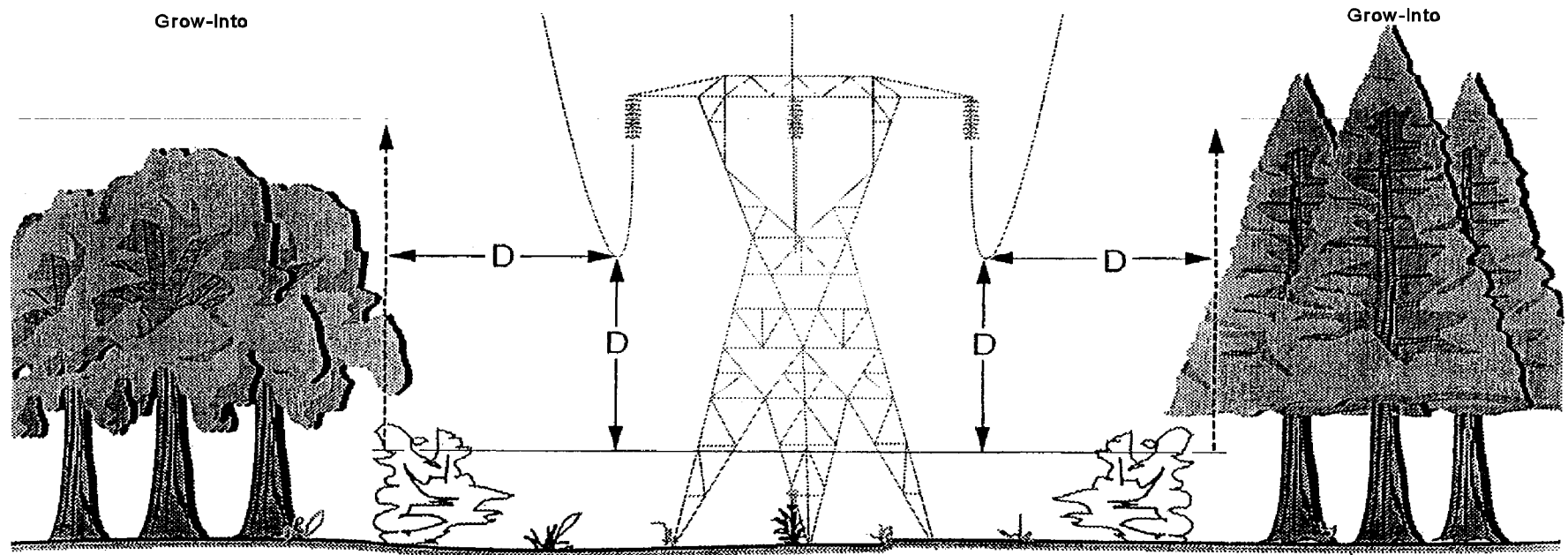
1. The clearance values include an allowance for conductor movement (sag)

BRANCHES OR TOPS BENDING WITHIN MINIMUM DISTANCE OF THE CONDUCTOR

**BEND-INTO
DANGER TREES AND BRUSH**

ADAPTED FROM BPA 1985

FIG. 10-3



Scenario:
DANGER TREES, off R.O.W., having branches growing into the Safety Zone.

BRUSH, on R.O.W., having branches or tops growing into the Safety Zone.

Notes:

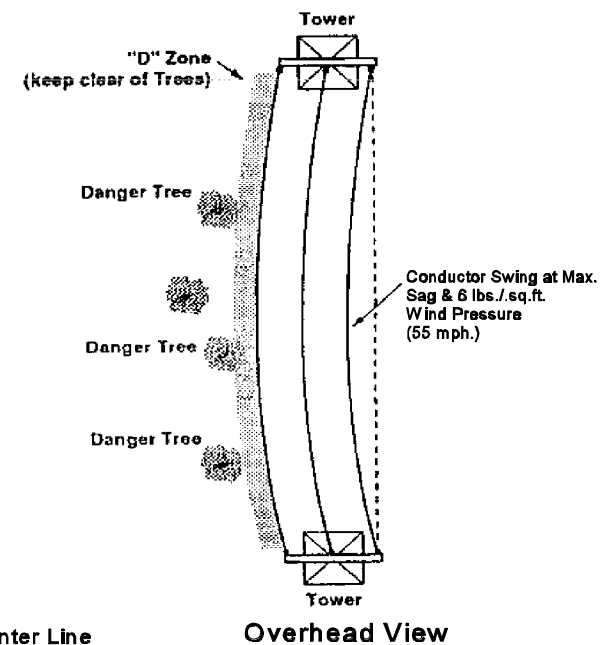
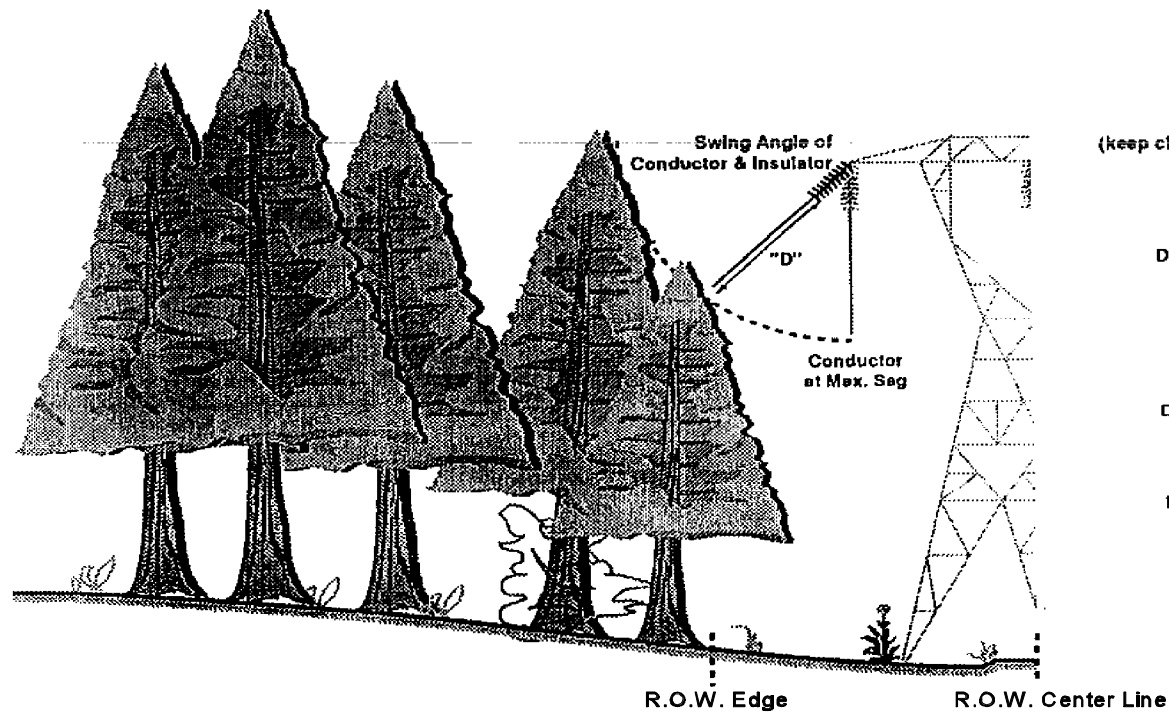
1. The clearance values include an allowance for conductor movement (sag).

BRANCHES OR TOPS GROWING WITHIN MINIMUM DISTANCE OF THE CONDUCTOR

**GROW-INTO
 DANGER TREES AND BRUSH**

ADAPTED FROM BPA 1985

FIG. 10-4



Scenario:
Wind causing conductor to blow into trees off
R.O.W.

When this occurs trees should be considered for
removal to the maximum swing position plus the "D"
distance.

SWING--INTO DANGER TREES AND BRUSH

ADAPTED FROM BPA 1985

FIG. 10-5

- **Swing-into trees** are trees located off and adjacent to the right-of-way whose branches would, or could, violate the minimum safety distance to the Conductor as a result of the conductor being blown toward the tree (see Figure 10-5).

Western's Right-of-Way Management Guidance for Danger Trees, Encroachments, and Access Routes is contained in WAPA Order 6460.1 (3/1/95), provided as Appendix E.

Where provided in the right-of-way permit or easement contract, Western Maintenance Managers may remove danger trees within the right-of-way that present an existing or potential hazard to the facility and/or human health and life. Western's policy is to remove danger trees during normal maintenance or as noted during annual line inspections (see Appendix F for Sample Survey form).

Where Federal right-of-way permits or easement contracts dictate that danger trees may only be topped within the right-of-way, Western shall seek to have such permits and contracts amended to allow the removal of grow-into or other danger trees within the ROW area, and to allow the trimming or removal of bend-into, swing-into, fall-into and other danger trees on land adjacent to the ROW.

In an effort to minimize visual impacts that will result from tree removal and to maintain good customer relations, Western will notify private landowners and government entities prior to conducting tree removal actions. Where emergency removal of danger trees is necessary within or adjacent to the easement or permit areas, and prior notice is not possible, Western's Maintenance Manager is responsible for initiating or coordinating notification after the fact. Where provided in the easement contract, reasonable compensation may be paid to the landowner, and/or low growing vegetation may be planted to minimize the tree removal impacts.

If tree removal is limited by Federal land use restrictions, danger trees should be topped or trimmed. For example, the U.S. Forest Service has visual zones along roads, rivers, streams, and near campgrounds that require more limited clearing; these would be examples of areas where topping or trimming is done, unless the Federal permit can be modified. Where topping is required, it should not remove more than 50 percent of the tree, or else the tree is likely to die and become unsightly and/or a danger to the line.

The following describes the selection and removal of danger trees:

- **Fall-into trees** have a high probability of becoming a hazard to the line. Usually these trees are diseased, damaged, or defective. Many unstable trees are found in strips or fringes left by logging activities. Others result from excavation, erosion, disease, etc. All inspection patrols should be alert to detect them, and remedial action should follow promptly.
- **Grow-into trees** have branches that could eventually grow into a line. Selection of grow-into trees will be based on the minimum horizontal distance between branch tips and conductor with both at rest. Beside arcing distance, this distance must include allowance for movement during storms, measurement error, and worker safety.
- **Bend-into trees** have tops or branches that could eventually bend down into a line. Danger tree selection will include trees which will become bend-into trees within the program maintenance interval, based on the current distance from the imaginary plane and the expected growth of the tree.
- **Swing-into trees** have been contacted by a swinging conductor. Swing contacts are rare because the wind sheltering effect of bordering trees suppresses conductor swing. They are most probable on long spans where the middle portion is exposed to the wind and the ends are closely bordered by trees, or where isolated trees have grown up alongside a long span. Clear-cut logging or isolated tree growth could potentially create new swing trees. Otherwise, lines which have not had swing contacts for ten years or more are not likely to have them in the future.

The clearing policy for new construction calls for the removal or topping of all trees within the theoretical swing limit plus an allowance for the prolonged clearance zone that prevents flashovers if the conductors swing out, due to high winds. During maintenance, trees are not selected for removal based solely on theoretical swing calculations. However, over time, as regrowth of trees off the right-of-way occurs, some spans may develop a history of swing contacts. When a history of swing

contacts are noted, consideration should be given to clearing all trees within the theoretical swing limits.

In some cases where trees must be removed, an agreement is reached with the land management agency or landowner to replace the lost trees. An example **Tree Replacement Agreement** is provided as Appendix T.

11.1 INTRODUCTION

Western's historical vegetation management activities have been restricted primarily to the control of vegetation which will pose a fire or safety hazard to transmission facilities. The existing vegetation management control program has now been expanded to include the control of noxious or undesirable weeds on fee-owned land or selected rights-of-way during the early planning stages of a construction project, through construction, and into the final stage which involves normal facility maintenance activities. The following sections describe Western's Noxious Weed Management Policy and its implementation during all stages of construction and maintenance activities.

11.2 THE INCREASING PRESENCE AND IMPACT OF NOXIOUS WEEDS

Virtually all noxious weed species are non-native plants that have found ideal growing environments in North America. In their native European habitats, insects, competing organisms, and soil and moisture conditions combine to keep these weeds in check. But in the western United States, an ideal environment, coupled with the species' prolific reproductive capabilities (seed production) and the lack of natural predators, create some very tough vegetative adversaries. Many noxious weeds were introduced by our pioneer ancestors who unknowingly utilized weed-contaminated hay or grain as they settled the West. Noxious weeds have become established and are rapidly spreading on both public and private rangeland and farmland. As a result, crop yields and wildlife habitat are being reduced, livestock is poisoned, native plants are displaced, and rangeland in good ecological condition is being invaded.

Throughout the West an enormous amount of time and money is spent each year to manage millions of acres infested with undesirable plants. A large percentage of this time and money is spent by those in agriculture. These plants also severely reduce the value of non-agricultural land, including residential property, parklands, and wilderness. Noxious weeds pose a serious threat to the continued economic and environmental value of the lands of the western United States.

11.3 FEDERAL, STATE AND COUNTY LAWS/REGULATIONS

The Federal Noxious Weed Act of 1974, as amended by Sec. 15, Management of Undesirable Plants on Federal Lands, 1990, mandates each Federal land management agency to:

1. Designate a lead office and person trained in the management of undesirable plant species
2. Establish and fund an undesirable plant management program
3. Complete and implement cooperative agreements with State agencies
4. Establish integrated management systems to control undesirable plant species

Recently, all Federal agencies responsible for the management of public lands established an interagency committee which agreed to work cooperatively to manage noxious weeds, increase public awareness, support further research, and provide technical assistance on private lands to accomplish an integrated approach to the management of noxious weeds (see Appendix M).

Western's General Counsel has concluded that language in the act requires Western to take action on lands we own and have jurisdiction over, including easements and rights-of-way. Additionally, the Department of Energy's (DOE) Office of Environmental Guidance has instructed Western to comply with all Federal and State mandates to control undesirable weeds.

Thirteen states within Western's service area (exceptions are New Mexico and Texas) have passed laws which allow the governing body of a weed management district to ensure that all lands of the State, whether in public or private ownership, are managed to prevent the spread of undesirable plants designated by the State (see Appendix B - State Noxious Weed Regulations). Additionally, the majority of State weed management laws allow the governing body of a weed management district (usually the county) to designate additional undesirable plants for management within its jurisdiction. For example, in 1990 the Colorado Legislature

passed the Colorado Undesirable Plant Management Act (HB 1175) requiring county governments to develop integrated weed management plans that would include Federal agency involvement in controlling specific weeds in Colorado. Section 2.0 and Appendixes A and B provide specific reference information on Federal and State noxious weed regulations; however, **be sure to check with the appropriate County agency** (usually a Weed Management Board) for county-specific requirements.

11.4 LESSONS LEARNED

In 1981, Bonneville Power Administration (BPA) constructed its Chief Joseph-East Omak transmission line. The easement rights for one of the landowners had been appraised at \$6,800; however, the landowner asked for \$119,600. Ultimately the courts awarded \$336,000 for this right-of-way. Most of this award was for damages allegedly resulting from the spread of undesirable plants. In an effort to ensure that future court cases did not produce similar settlements, BPA established a four-stage noxious weed policy which is composed of: (1) a preconstruction survey to identify and photo-document existing noxious weeds infestations, (2) implementation of measures to control the spread of noxious weeds during construction activities, (3) immediate post-construction field review with affected landowners to outline specific weed control responsibilities, including funding, and (4) ongoing maintenance activities to control noxious weeds on BPA fee-owned properties and, when appropriate, on rights-of-way easements.

An article was printed in the Tuesday, August 17, 1993, issue of the Montrose Daily Press, Montrose, Colorado, about a local rancher who claimed musk thistle (a prolific undesirable weed) spread from Federal government land (Western's Curecanti Substation fee land) to his property. The rancher stated that musk thistle infested up to 10 acres of the 800 acres he owns, resulting in losses of up to \$2,000 in grazing fees. The negative publicity received by Western could have been avoided had we been aware of the need to control noxious weeds identified by the County Weed Advisory Commission. To resolve this issue, Western personnel met with the County Weed Advisory Commission to discuss future measures which will be taken to prevent the spread of musk thistle from Western fee-owned property and transmission line rights-of-way located in Montrose County.

11.5 FEE-OWNED VERSUS NONFEE-OWNED LANDS

Western's land management and rights administration fall within two general areas; fee-owned/withdrawn and nonfee-owned (easements, rights-of-way, permits, etc.). Weed management practices, responsibilities, and liabilities for these two situations are quite different. **In the fee-owned/withdrawn situation**, Western is the property owner/administrator and must assume the burden of full compliance with the weed laws. **In the nonfee-owned situation**, Western must defer to the landowner or administrator as the responsible party for compliance with Federal and State laws, while ensuring that any actions taken are not detrimental to the rights held by Western.

Implementation of Western's noxious weed policy should be prioritized according to Western's vested interest in the land. **First priority for noxious weed control should be on those lands owned by Western in fee.** **Second priority for control of noxious weeds should be on nonfee-owned Federal lands where transmission facilities either cross or occupy Federal land and where noxious weed infestations occur within permitted areas.** **Third priority for control of noxious weeds should be on or across non-Federal government lands.**

The following sections are proposed guidelines for Western weed management involvement under the two general areas described above.

11.5.1 Western Fee-Owned/Withdrawn Property

Western shall be responsible for the inventory, treatment, and control of those weed species identified by State and/or county noxious weed laws. The CSO - Office of Environment has developed Western-wide vegetation management program guidance for herbicide and pesticide use, compliance, and monitoring. While current weed control practices generally involve the eradication of all vegetation within controlled sites, such as substations, other fee-owned property, such as buffer zones, receive minimal weed management effort. Given Western's responsible and liability under the Federal law, Western has looked to State law for coordination and compliance requirements, including the identification of target

undesirable plants. Western shall be responsible for the inventory, treatment, and control of those weed species identified by State and/or county noxious weed laws. Where necessary, the Western Regional Office will notify the County Agent or County Board of Western's weed management activities.

Where chemical (herbicide) control is carried out by Western personnel, all spray crew personnel should be familiar with the identification of noxious weed species targeted for management by the State/county. **Figures 11-1a through 11-1d provide photos of some common noxious weed species.** After targeted weed species are identified, Western-approved herbicides can be selectively applied to remove the undesirable species, while maintaining and encouraging the development of desirable shrubs and grasses. **Table 11-1 lists the most common noxious weeds expected to be encountered in Western's service area and the herbicides recommended for each weed.** For problem weed infestations such as **Canada and musk thistle, knapweeds, and ragweeds** outside the substation or yard, the herbicide Transline[®] provides excellent control. The active ingredient is clopyralid. It is registered for selective control of broadleaf weeds in non-cropland areas, industrial manufacturing and storage sites and rights-of-way. By removing only unwanted weeds and brush, Transline[®] allows grass to live, thus preserving a grassy ground cover which prevents erosion.

Where vegetation management activities on Western fee-owned land involve contractor application of herbicides, language in statements of work should instruct the contractor to not only control weed growth within the security fence, but also to selectively control the growth of State/county targeted weed species on nearby Western fee-owned land. These fee-owned lands generally include substations and buffer zones, access roads, and electric transmission line approaches.

Noxious Weeds
SCOTCH THISTLE (*Onopordum acanthium*)
(Source: The British Columbia Ministry of Agriculture and Food)



GROWTH HABIT: Biennial, sometimes annual, erect, up to 8 ft. tall. **Rosette formed first year, flowering stem elongates second year.**

LEAVES: Large, coarsely lobed, **hairy on both sides velvety gray appearance.** Margins lined with sharp conspicuous spines. Basal leaves up to 2 ft. long and 1 ft. wide.

STEMS: Erect, branching, **spiny leaf wings extend down onto stem,** covered with dense fine hairs.

FLOWER: Solitary, terminal, 1 to 2 inches in diameter violet to reddish colored. Bracts spine tipped.

ROOTS: **Large fleshy taproot.**

SEEDS: Deep brown to black, distinctly wrinkled, 3/16 in. long.

OTHER: **Reproduce by seed only.** Dense stands may be impenetrable to livestock.

Noxious Weeds

DIFFUSE KNAPWEED (*Centaurea diffusa*)

(Source: The British Columbia Ministry of Agriculture and Food)



Bolting plant

GROWTH HABIT: Annual or biennial, bushy, up to 2 ft. tall. **Rosette formed first year flowering stalk elongates second year.**

LEAVES: Greyish-green, alternate, basal leaves whorled, upper leaves much reduced. **Covered with fine hair.**

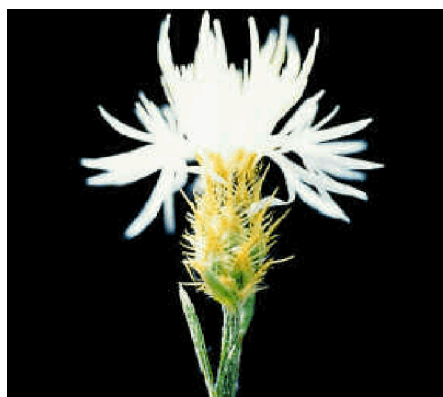
STEM: Hairy, erect, **single main stem** from a rootstock, branched near or above the base.

FLOWER: Solitary, usually white, sometimes pink, rose or lavender; **seedhead bracts end as sharp, rigid spines.**

ROOTS: Elongated taproot.

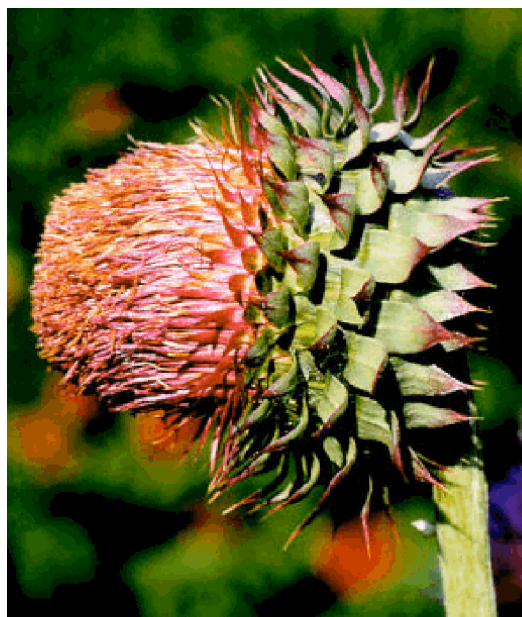
SEEDS: Oblong, dark brown or grey with **longitudinal lines.**

OTHER: May seriously reduce productive potential of infested rangelands.



Rigid spines on tips of flower bracts

Noxious Weeds
MUSK THISTLE (*Carduus nutans*)
(Source: The British Columbia Ministry of Agriculture and Food)



*Large flowers with spine-tipped
bracts "nod" at maturity*

GROWTH HABIT: Biennial, or winter annual, erect up to 7' tall. Freely branching. **Rosette formed 1st year, flowering stem elongates 2nd year.**

LEAVES: **Dark green with light midrib, hairless on both sides**, long sharp spines.

STEM: **Hairless.**

FLOWER: Solitary, terminal, **nodding heads 1 1/2" to 3" diameter, deep rose to violet to purple.**

ROOTS: Fleshy **tap root**, hollow near ground surface.

SEEDS: Can be in excess of 20,000 per plan with 90% viable. Ninety percent may germinate in first 2 years. Seeds may germinate after 10 years in soil.

OTHER: **Reproduce by seed only.**

Noxious Weeds
HOARY CRESS (*Cardaria draba*)
(Source: The British Columbia Ministry of Agriculture and Food)



Heart-shaped seedpods



"White-top" infestation

GROWTH HABIT: Perennial herb, up to 24' tall, erect, **becoming lodged with age.**

LEAVES: Alternate, lance-shaped and slightly irregular, **greyish-green, base of upper leaves clasp stem.**

STEMS: Stoutish, branched toward top.

FLOWERS: Small, white, 4 petals; numerous flower branches and dense flowers give plant a **dense, white, flat-topped appearance.** Numerous white flowers produced at the top of the plant gives rise to its other common name of "white-top".

ROOTS: **Extensive** horizontally and vertically **frequent shoots arising from root stocks.**

SEEDS: Reddish-brown, granular, egg-shaped, contained in heart-shaped pods.

OTHER: **Flowers early** (April and May), **reproduces by seeds, root stocks and creeping roots.**

Noxious Weeds
FIELD BINDWEED (*Convolvulus arvensis*)
(Source: The British Columbia Ministry of Agriculture and Food)



GROWTH HABIT: Perennial **vine**, reproducing from seeds and roots.

LEAVES: Alternate, simple, **arrowhead-shaped, rounded or blunt tipped**.

STEM: **Prostrate, twining and mat-forming**, up to 10 ft. long.

FLOWER: **Funnel-shaped**, pale pink to white, up to 1 in. wide; **two small scale-like bracts** attached below flower on flower stem.

ROOTS: **Creeping rhizomes**, extensive.

SEEDS: Four per capsule, dark grey to reddish brown, three sided.

OTHER: Seeds viable over 60 years. **Often confused with wild buckwheat which has heart-shaped sharp pointed leaves and tiny inconspicuous flowers.**

Noxious Weeds
SPOTTED KNAPWEED (*Centaurea maculosa*)
(Source: The British Columbia Ministry of Agriculture and Food)



Flowerhead bracts with black-tipped fringe giving head a "spotted" appearance

GROWTH HABIT: Biennial or short lived perennial, up to 3 ft. tall. **Rosette formed first year flowering stalk elongates second year.**

LEAVES: Long and divided below, **short and narrow above. Covered with fine hair.**

STEM: Erect with slender wiry branches. **Covered with fine hair.**

FLOWER: Seed heads mostly on branch tips solitary, to 1" diameter. **Pink to purple, rarely white. Seed head bracts are black tipped**, with 5 to 7 pairs of short feathery appendages.

ROOTS: Taproot not well developed.

SEEDS: Brownish, 1/8" long, notched on one side of base, short tuft of bristles at tip end.

OTHER: Very aggressive, can infest large areas quickly, offers very little big game or livestock forage value.

Noxious Weeds
PLUMELESS THISTLE (*Carduus acanthoides*)
(Source: The British Columbia Ministry of Agriculture and Food)



Spiny winged stems

GROWTH HABIT: Biennial, sometimes annual, erect, up to 8 ft. tall. **Rosette formed first year, flowering stem elongates second year.**

LEAVES: Dark green with a light midrib, hair only on the underside, leaf margin with sharp spines.

STEMS: To 4 ft. tall, erect, **winged to flowering heads.**

FLOWER: Solitary, terminal or clusters of 2 to 5. Narrow seedhead bracts spine tipped. **Reddish-purple blooms 1/2 to 1 inch diameter.**

ROOTS: Stout fleshy taproot.

SEEDS: Striped lengthwise, slightly curved, with a protrusion at one end.

OTHER: **Reproduce by seed only.**

Noxious Weeds
RUSSIAN THISTLE (*Salsola kali*)
(Source: The British Columbia Ministry of Agriculture and Food)



Spine-tipped leaves



Seedling

GROWTH HABIT: Annual which reproduces by seed.

LEAVES: Alternate with the first ones being dark green, soft, slender, and 1 to 2 1/2 inches long. These drop off and later leaves are short, stiff, spiny, with two sharp-pointed bracts at the base.

STEM: Rounded, bushy, much branched annual growth to 1.2 meters in height; stem usually red or purple striped.

FLOWER: Inconspicuous, green with 2 spiny-tipped stiff bracts.

SEEDS: Can produce over 200,000 seeds per plant.

OTHER: Nicknamed "tumbleweed" when mature plants blow on the wind.

Noxious Weeds

KOCHIA (*Kochia scoparia*)

(Source: The British Columbia Ministry of Agriculture and Food)



Seedling



Flower clusters

GROWTH HABIT: Annual, erect, up to 6 ft. tall, spreading by seeds.

LEAVES: Narrow, bright green, hairy, numerous and attached directly to the stem. The upper leaves are narrow. Entire margins often turn purple in autumn.

STEM: Erect, round, slender, pale green, much branched. Main stem often tinged with red.

FLOWER: Inconspicuous in the axils of upper leaves.

OTHER: Also called Fireweed or Mexican burning bush.

Noxious Weeds
CANADA THISTLE (*Cirsium arvense*)
(Source: The British Columbia Ministry of Agriculture and Food)



Flowerheads with spineless bracts



Seedling



Young rosette

GROWTH HABIT: Perennial, erect, up to 4 ft. tall.

LEAVES: Varies from **light to dark green, oblong or lance-shaped**, deeply cut, spiny toothed margins (some may be smooth) slightly hairy below. Tremendous leaf variability.

STEM: Smooth to **slightly hairy**, branched at top.

FLOWER: **Small bristly clusters, 3/8 to 5/8 inch in diameter**, light lavender to deep rose purple. Plants are male or female.

ROOTS: Extensive, fleshy, **creeping root stocks**.

SEEDS: Smooth, light to dark brown, tipped by a cupped conical point, approx. 1/8" long.

OTHER: Reproduces by seed and creeping rootstocks.

Noxious Weeds
LEAFY SPURGE (*Euphorbia esula*)
(Source: The British Columbia Ministry of Agriculture and Food)



*Greenish-yellow flower clusters
and bracts*



Creeping rootstocks

GROWTH HABIT: Perennial, erect, up to 3 ft. tall, spreading by seed or **creeping roots**.

LEAVES: Alternate, **long, narrow**, 1/4" wide and 2" long, usually drooping.

STEMS: Branched near top, hairless, **entire plant contains milky sap**.

FLOWERS: Inconspicuous, surrounded by **large heart-shaped floral leaves** which turn **yellow-green** near maturity.

ROOTS: **Brown, numerous pink buds**, deep spreading, very persistent.

OTHER: Grows in nearly all soil types and habitats. Seed is thrown to 20' by exploding seed capsule. All parts of the plant contain a white milky latex that can irritate skin of livestock and humans.

Noxious Weeds
DALMATIAN TOADFLAX (*Linaria dalmatica*)
(Source: The British Columbia Ministry of Agriculture and Food)



Snapdragon-like flowers



Waxy leaves clasp the stem

GROWTH HABIT: Perennial, often over 3 ft. tall, erect.

LEAVES: Light green, alternate, **broad, heart-shaped**, clasping the stem.

STEM: Branching, light green, smooth, and **leafy**.

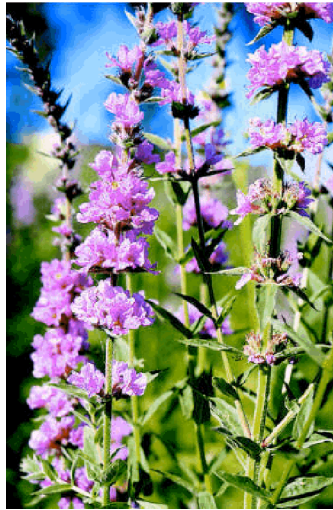
FLOWERS: Snapdragon type, **bright yellow**, tinged with orange, **to 1 1/2" long with long spur**, born in upper leaf axils.

ROOTS: Vigorous, deep and extensive, **creeping roots**.

SEEDS: Numerous, irregularly angled.

OTHER: Spread by seed and creeping roots. Likely introduced to North America as an ornamental.

Noxious Weeds
PURPLE LOOSESTRIFE (*Lythrum salicaria*)
(Source: The British Columbia Ministry of Agriculture and Food)



*Purple flowers produced on
terminal spikes*



Seed-bearing spikes

GROWTH HABIT: Wetland perennial, 1 1/2 to 8 ft. tall in height.

LEAVES: Opposite or sometimes whorled stalkless leaves.

STEM: Stiff, four-sided stem.

FLOWERS: Purple flowers in a dense terminal spike.

ROOTS: Woody taproot and branching fibrous root system.

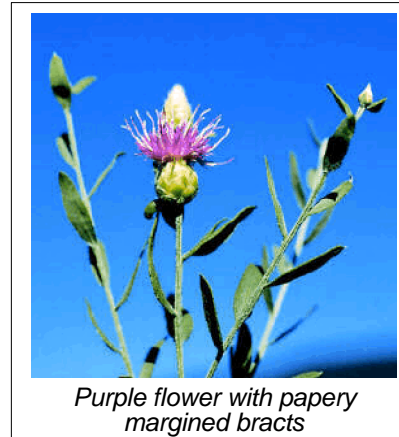
SEEDS: Can produce over 2.5 million seeds annually.

OTHER: Sometimes confused with fireweed (*Epilobium angustifolium*), many infestations have resulted from escape of ornamental varieties. Highly aggressive invader species. If left unchecked, a wetland will eventually become a monoculture of loosestrife. This plant poses a severe threat to waterfowl habitat.

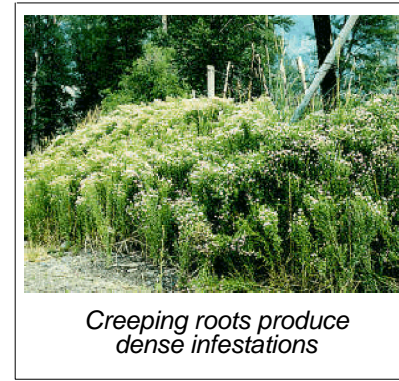


Fireweed

Noxious Weeds
RUSSIAN KNAPWEED (*Acroptilon repens*)
(Source: The British Columbia Ministry of Agriculture and Food)



*Purple flower with papery
margined bracts*



*Creeping roots produce
dense infestations*

GROWTH HABIT: Perennial herb, up to 3 ft. tall, erect, may be in dense clumps. Greyish color.

LEAVES: Alternate, simple, of **several types**:

Upper leaves - small, narrow, unbroken edge;

Stem leaves - intermediate in size, slight toothed margins;

Basal leaves - deeply notched.

STEM: Numerous branched, each ending with a single flower.

FLOWER HEAD: Single, **terminal, lavender, thistle-like, scaly seed head**.

ROOTS: **Dark brown to black and heavily scaled.**

SEEDS: Flattened, ivory-colored, **retained in cup-shaped seed heads.**

OTHER: Leaves and stems covered with short stiff hairs giving **plant an appearance of knap**. Spreads by seeds and creeping rootstocks. It is very poisonous to horses.

TABLE 11-1
HERBICIDES FOR NOXIOUS WEED CONTROL

| Noxious Weed (Common Name) | Recommended Herbicide(s) | Optimum Treatment Time | Quantity | Notes |
|-------------------------------|------------------------------|--|------------------------|----------------------------|
| Canada Thistle | Vanquish® +2,4-D | End of bud stage or fall | 1 quart each/acre | -- |
| | Tordon® +2,4-D | | 1 quart each/acre | -- |
| | Tordon® +Vanquish® | | 1 pint each/acre | -- |
| | Curtail® (Clopyralid +2,4-D) | From rosette (6-8 inches) up to pre-bud stage. | 2 quarts/acre | -- |
| | Transline® | | 12-16 ounces/acre | -- |
| | Telar® | Bud to early bloom or fall. | 1 ounce/acre | Roadside/non-crop land use |
| Musk Thistle | Vanquish® +2,4-D | Rosette stage (spring and fall) | 1 pint + 1 quart/acre | -- |
| | Tordon® +2,4-D | | .5 pint + 1 quart/acre | -- |
| | Tordon® +Vanquish® | | .5 pint + 1 pint/acre | -- |
| | Telar® | After bolt up to early flower stage. | 1 ounce/acre | -- |
| | Curtail® (Clopyralid +2,4-D) | Rosette (spring or fall) up to pre-bud stage. | 2 quarts/acre | -- |
| | Transline® | Rosette stage (spring and fall) up to pre-bud stage. | 12-16 ounce/acre | -- |

TABLE 11-1
(Continued)

| Noxious Weed (Common Name) | Recommended Herbicide(s) | Optimum Treatment Time | Quantity | Notes |
|-------------------------------|------------------------------|---|----------------------------|--|
| Leafy Spurge | Tordon® +2,4-D | Spring during true flower stage or fall to regrowth. | 1-2 pints + 1 quart/acre | 3-4 years consecutive treatment necessary. |
| | Vanquish® +2,4-D | | 1-2 quarts + 1 quart/acre | Should combine chemical control with other methods - e.g., chemical or cultural. |
| | Roundup® +2,4-D | Treat 2-3 times/season with first treatment at true flower stage and subsequent treatments at 30 day intervals. | .5-1 pint + 1-2 pints/acre | Use under trees or combine with reseeding of competitive perennial grass. |
| Russian Knapweed | Tordon® +2,4-D | Bud Stage or fall. | 1 quart each/acre | -- |
| | Vanquish® +2,4-D | | 1-2 quarts + 1 quart/acre | -- |
| | Curtail® (Clopyralid +2,4-D) | Rosette to early flower. | 3 quarts/acre | -- |
| | Transline® | | 18-24 ounces/acre | -- |
| | Telar® | Fall. | 1 ounce/acre | -- |
| Diffuse and Spotted Knapweed | Tordon® | Rosette to early bolt. | 1 pint/acre | -- |
| | Tordon® +2,4-D | | 12 ounces + 1 quart/acre | -- |
| | Tordon® + Vanquish® | | .5-1 pint +1-2 pints/acre | -- |
| | Vanquish® +2,4-D | | 1 pint + 1 quart/acre | -- |
| | Curtail® (Clopyralid+2,4-D) | | 2 quarts/acre | -- |

**TABLE 11-1
(Concluded)**

| Noxious Weed (Common Name) | Recommended Herbicide(s) | Optimum Treatment Time | Quantity | Notes |
|---|--------------------------|--|-------------------|--|
| Field Bindweed | Vanquish® +2,4-D | During flower stage or fall. | 1 quart each/acre | -- |
| | Tordon® +2,4-D | | 1 quart each/acre | -- |
| | Tordon® +Vanquish® | | 1 pint each/acre | -- |
| Hoary Cress (Whitetop) | Telar® | Bud to early bloom stage. | .5-1 ounce/acre | Roadside/noncropland |
| | | | .5-.75 ounce/acre | Range/pasture |
| | 2,4-D amine | Apply first treatment at early bloom stage, second treatment at mid summer (July), and third treatment to any fall regrowth. | 2-3 quarts/acre | -- |
| Perennial Pepperweed (Tall Whitetop) | Telar® | Bud to early bloom stage and fall rosette. | 1 ounce/acre | Roadside/noncropland |
| | 2,4-D amine | Apply first treatment at early bloom stage, second treatment at mid summer (July), and third treatment to any fall regrowth. | 2-3 quarts/acre | -- |
| Yellow and Dalmation Toadflax | Tordon® | Bud to early bloom. | 1-2 quarts/acre | When using 1 quart/acre treat for 2-3 conservative years |
| Kochia | Vista® | Apply to actively growing weeds. | 2/3 - 1 1/2 pt/ac | -- |

Source: Colorado Weed Management Association and Dow

Western will employ an integrated treatment strategy depending on site location and environmental considerations. Successful noxious weed management strategies will combine several control techniques into an integrated vegetation management approach. Treatment may be mechanical, biological, chemical, or any combination of the three methods. It should be emphasized that Western's use of herbicides for vegetation management is selective with respect to the kinds of herbicides used, as well as the technique chosen to deliver the material to the target species. Herbicides should not be applied in an indiscriminate broadcast spray across entire fee-owned lands.

Western's completed and approved vegetation management guidance can be used as a vehicle for entering into good neighbor Weed Management Plans, when necessary, with Federal, State, or local government entities. This practice will help to ensure consistency throughout Western. The vegetation management guidance includes any or all of the following:

- Site Specific Weed Inventories
- Integrated Approaches for Control
 - Mechanical Control (Manual, Mowing)
 - Biological Control (Introduce Natural Insect Predators, Grazing)
 - Chemical Control (Herbicides, Fertilizers)
- Environmental Protection Requirements and Best Management Practices
- Herbicide Application Certification Requirements
- New Vegetation Control Methods Procedures
- Monitoring and Reporting Procedures

11.5.2 Western Nonfee-Owned Rights

The administration of Western's rights on other than fee-owned land is difficult to assess in terms of responsibility and liability, especially where weed control is at issue. As stated in the assumptions above and pertaining to weed management responsibility, Western will defer compliance with Federal and State weed control laws and regulations to the landowner or administrator. There is a potential liability issue associated with this assumption in terms of "cause and effect". Weed

occurrences may have resulted from or may have been accelerated by construction activities associated with transmission line and related facilities installations. Given the relationship of Western as a right-holder on the land and the fact that it is in Western's best interest to develop a good neighbor policy, Western would provide funding support, where deemed appropriate and where funds are made available, to the government entity responsible for compliance with the Federal and State laws.

The following subsections provide a breakdown of Western's activities involving the various landowner/administrator situations.

Rights On or Across Federal Lands

Western is responsible for the development of Interagency Agreements (IA) which includes the management of noxious weeds (see Section 2.4). Where there are active county-wide weed management programs, Western will advise the county of its ongoing efforts with other Federal agencies and will support the integration of such efforts when in the best interest of the government to do so.

IAs will be developed with the Federal agency with surface administration jurisdiction, where necessary. As in the case of BLM, an environmental impact statement was finalized in 1991 that specifies their weed control commitment in the Western States, excluding California. BLM assumes the responsibility of weed management planning and implementation on all lands within their administration. If necessary, Western may execute an IA providing for funding support given Western's right-of-way and Western's acceptance of the estimate and availability of funds.

The Colorado River Storage Project Office and the CSO - Office of Environment have developed IAs with Colorado western slope Forest Service District Offices in 1994 and 1995. This effort will serve as a pilot for other State weed control activities, where necessary.

Executed IAs will be forwarded to the specific County Agent or Board, when applicable, to ensure coordination and as an effort to demonstrate Western's good intentions toward controlling specific weed problems.

Rights On or Across Non-Federal Government Entities (State or Local)

Cooperative agreements will be developed with State or local government entities with surface administration jurisdiction, where necessary. These government entities are responsible for compliance with State laws, as well as the EPA regulations concerning the application of herbicides. The entity would provide Western with a plan and, after approval and availability of funds, Western will direct transfer of funds to the designated representative. Copies of executed cooperative agreements will be forwarded to the County Agent or Board for coordination purposes, where applicable.

Rights On or Across Private-owned Lands

Cooperative agreements will be developed with County Agents or Boards in those counties where weed management plans have been implemented and where private lands containing Western facilities and their associated rights are within identified weed control areas. The County Agent or Board would be responsible for the inventory and identification of targeted undesirable plants or private lands and the corresponding Western easement. Where Western concurs with the findings and recommendation for control, including cost estimates, funding may then be directed to the respective county representative. Direct coordination with the landowner is not recommended due to the requirements for compliance with State law and EPA regulations. Payments to landowners who are not certified or trained in herbicide application are, in themselves, a liability concern.

The CSO - Office of Environment, as well as the Regional Office Environmental staff, can provide direct support in the development of such cooperative agreements. Western has developed and implemented cooperative agreements with Colorado west slope counties in 1994 and 1995. Given their successful implementation, they may be used in other counties and States, where necessary and given funding support capability.

Part of Western's overall Vegetation Management Plan includes areas where the **growth of vegetation, not control**, is desirable or necessary to reduce visual impacts, to reduce erosion and sedimentation, to meet reclamation requirements on Federal or State land, or to preclude the growth of non-desirable weeds. This section addresses Western's policies and procedures for establishing low-growing vegetation and reclaiming of disturbed areas through seeding.

12.1 SITUATIONS REQUIRING REVEGETATION/RECLAMATION

The following are situations or site conditions where revegetation or reclamation may be required:

- **Ground-disturbing activities** where construction or maintenance activities have left bare ground areas along the right-of-way, around or adjacent to a substation or storage yard, and where vegetative cover is desirable.
- Areas where **chemical spills** occurred and contaminated soils have been removed during cleanup.
- **Areas of high erosion potential.** This includes sites where there is little or no vegetative cover and the potential for wind or water erosion is unacceptable, such as on steep slopes, drainages, or stream banks, and in certain soil types such as fine sand or soils high in silt.
- **Replacement of danger trees** with a stable, low growing plant community on the ROW such as grasses and shrubs. This type of plant community would be compatible with transmission line facilities,

provide ground cover, retard the re-growth of tall-growing vegetation and reduce the frequency of future ROW maintenance operations and the potential interruption of service. In Bismarck, ND, Western has developed a tree replacement agreement with local landowners and the conservation district. Under this agreement, tall trees in and near the transmission line ROW are removed and replaced with low-profile shrubs. Contact the Upper Great Plains Region-Contract Specialist for further details.

- **Areas with certain noxious weed control problems.** Noxious weed control may be accomplished by seeding along ROWs to establish a competitive perennial grass to reduce the establishment or reestablishment of noxious weeds (e.g., leafy spurge).
- **Areas where timber and slash disposal** could maximize the use of wood resources that are compatible with the surrounding land use and reduce the fire hazard within the transmission line ROW.
- **Areas where grazing is the preferred method** of vegetation management. Seeding can provide forage for livestock or wildlife.

12.2 REVEGETATION METHODS

Revegetation methods are generally limited to seeding of grasses in most circumstances where Western must revegetate or reclaim sites as described in Section 12.1. On occasion, Western has been required to replace trees and shrubs which provide endangered species habitat or replace wetlands.

When determining the best method of seeding, several options may be available depending on the following factors:

- Size of the area to be seeded
- Terrain of the area to be seeded
- Site access
- Seedbed conditions such as soil texture, erodibility, percent of sandy fragments (rocks and gravel), and permeability
- Climatic conditions such as the amount of precipitation, temperature regime and wind conditions in the particular geographic region
- Costs of seed and equipment

Method options for seeding include:

(Note: The following information was obtained from the U.S. Bureau of Land Management Manual of Revegetation Techniques which can provide more detailed information on seedbed preparation, planting, mulching and equipment (BLM 1984). Another good reference is Handbook of Western Reclamation Techniques (Office of Surface Mining Reclamation and Enforcement, n.d.)

Broadcast Seeding

Seed is spread manually or blown onto the ground surface via a rotary fan or ram-air device. The seed is held in a hopper with seeding rate controlled by the operator via an adjustable exit gate from the hopper to a fan. Equipment can be surface-operated from a truck or tractor, or hand-held.

The **advantages** of broadcast seeding are:

- Good for small-seeded grasses and shrubs.
- Good for small sites of 5 acres or less, or spot disturbances.
- Can be used on large acreages in steeply sloping or rocky terrain where access or suitability of seed drilling or hydro seeding equipment is limited.
- Equipment is generally cheaper, simpler and faster to operate.
- Most broadcast seeders can also spread fertilizer.

The **disadvantages** of broadcast seeding are:

- Establishment rate may be low when seed is spread on top of the ground and not covered.
- Not suited for compacted soils.
- Often requires twice the seeding rate of other methods.
- Uniformity of cover is unpredictable because seeding depth cannot be controlled.

Drill Seeding

The drill seeding method prepares a furrow, places seed at a specified depth, and covers the seed in one operation. The equipment basically consists of a seedbox with spout attachments through which seed falls on the prepared seedbed surface.

A wide variety of attachments increase adaptability to individual seeding needs. Attachments include depth bands to allow seeding at specific depths; individual seed compartments for different sizes of seed; a seed mixer for use in planting a variety of species; a seed metering device for even seed distribution; furrow openers; and packer wheels or drag chains to cover and pack soil around the seed.

The **advantages** of drill seeding are:

- Requires less seed than broadcast seeding. This can be important where expensive or scarce seed is specified for planting.
- Can be adjusted to place seed at specific depths to promote successful germination.
- Seeding rate and distribution of the seed can be controlled.
- Generally considered the most successful method of seeding where slope and seedbed conditions allow use.

The **disadvantages** of drill seeding are:

- More labor intensive than broadcast seeding
- Limited to level to gently sloping terrain (slopes up to 25 percent). Use on steeper slopes may be possible when towed by construction equipment.
- Generally not suited for rocky or brushy areas.

- Equipment costs are considerably higher than for broadcast seeding.
- Increased erosion potential.

Hydroseeding

A hydraulic seeder is towed on a trailer or is truck mounted. The seeder consists of a water tank with a pump and discharge nozzle. Passes are made along roads or trails while seed mix is sprayed via a water slurry. Mulch, tackifier, and fertilizer can be applied with the same method.

An internal agitator maintains a mix of seed in slurry throughout the process to ensure consistency. This method can be used on steep or rugged terrain with vehicle access.

The **advantages** of hydroseeding are:

- Fast, efficient method for large, steeply sloping, rocky, or gravelly areas where site characteristics are unfavorable to drill seeding.
- The seed can be sprayed on the site with a range of 20 to 200 feet.
- Fertilizer can be mixed with the slurry to accomplish fertilization and seeding in one pass.
- Germination of some hard-coated seeds may be enhanced by the agitators.

The **disadvantages** of hydroseeding are:

- Requires local water supply and considerable tank loading time.
- Seeds of some species may be damaged by pumps or agitators.
- Planting success is undependable unless seed is covered by mulch or other scarification techniques.

- Not suited for compacted soils.
- Seeding depth cannot be controlled.
- Contact time must be limited when seed and fertilizer are applied in the same slurry.
- Water slurry may falsely promote germination on sites lacking moisture for further establishment of perennials.
- In arid regions, water slurry may promote noxious weed growth prior to the desired species reaching the competitive stage.
- High initial cost investment.

Selection of a seeding method, seed mix, fertilizer requirements, and mulch requirements should be determined in consultation with the local Natural Resource Conservation Service (NRCS, formerly the SCS) or the local County extension agent. **Appendixes R and S provide contact information for these agencies, including State phone numbers and Internet address information.** Local office addresses, and phone numbers can often be obtained from the Internet or the main State phone contact. Based on the purpose of seeding and the desired end result, the checklist provided as Table 12-1 lists factors to be considered and reviewed with local experts on a site specific basis.

TABLE 12-1
CHECKLIST FOR DETERMINING SEEDING SPECIFICATIONS

- **Seed Mix**
 - Native vs non-native species? Generally use native grasses along the ROW unless planting is being done to exclude certain noxious species.
 - Species may be predetermined by Federal or State agency cooperative agreements.
 - Assistance in selecting seed mix available from Western's environmental staff, local NRCS or County extension offices (see Appendix R and S). Also Federal agency botanists, local seed companies.
- **Timing of planting**
- **Seeding rate**
- **Topsoil**
 - On-site sources available or additional sources needed?
 - Amount and depth of topsoil required?
- **Fertilizer**
 - Mix (N:P:K ratio)?
 - Amount and application rate?
- **Other soil amendments needed (e.g. organics)**
- **Seedbed preparation**
 - What preparation, if any, is necessary for a particular site?
- **Mulch**
 - Mulching necessary?
 - What type of mulch? (e.g., weed-free hay/straw, jute, plastic)
 - Amount and application rate?
- **Irrigation requirements**

Native Vegetation

It is desirable to use native plant species in your revegetation efforts. The establishment of native vegetation can provide food and cover for wildlife, help to compete against non-native noxious weeds, provide erosion control, and reduce maintenance costs. The best sources of information on types and sources native plant seeds will be area-specific. Contact your local NRCS representative (see Appendix R) or the local Extension Service office (see Appendix S); in most cases, the local conservationist can help to determine the best native species and supply information on local seed suppliers. In addition, if you are working with any Federal land agency (e.g., BLM, Forest Service), there may be a botanist on staff, or the agency may have a list of preferred native plants.

Table 12-2, Summary of Methods and Costs of Common Erosion Control Practices, covers various erosion control methods (including seeding, mulches, and erosion control materials), and provides information on potential for success and costs. Figure 12-1 provides a graphic representation of similar information, showing relative costs for various erosion control methods on various slopes. Some of the high cost/acre practices may be appropriate in small areas, e.g., chemical spills around substations. Table 12-3 lists different mulches and their relative advantages and disadvantages.

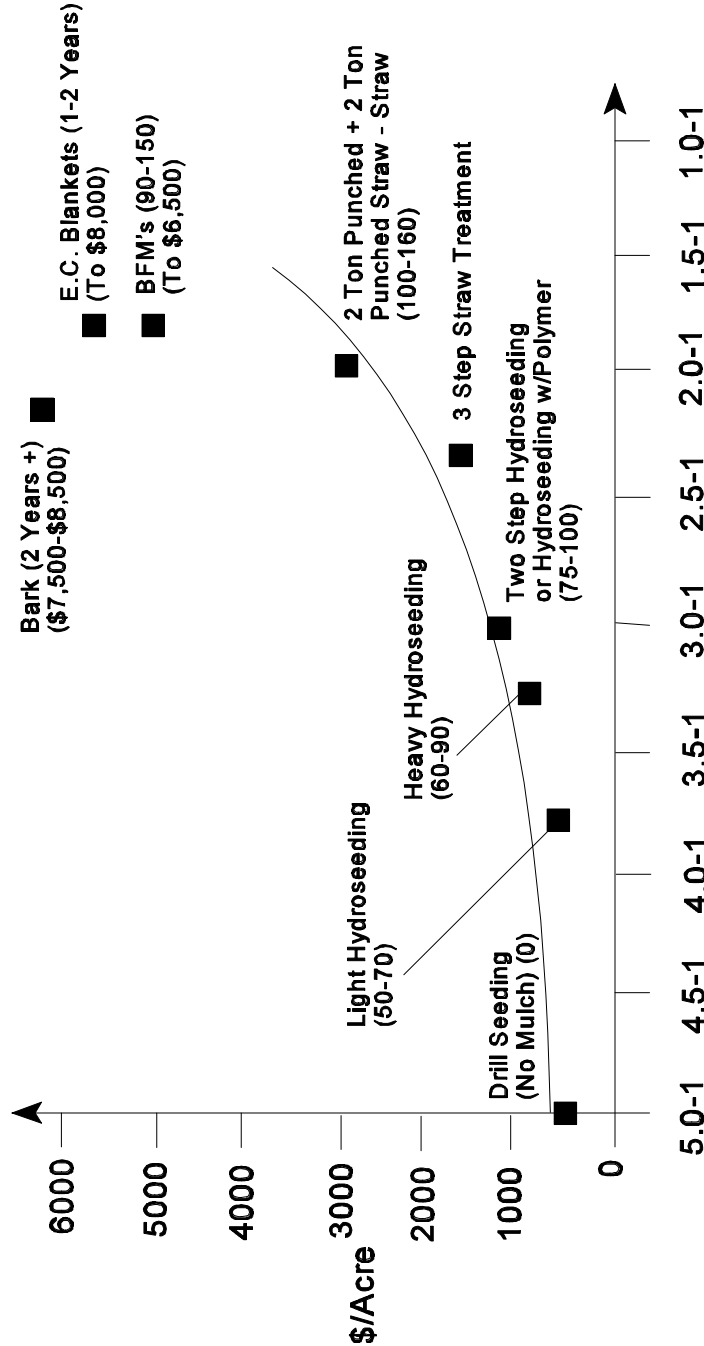
12.3 CONTRACTING FOR REVEGETATION/RECLAMATION

If a contractor is used to perform the seeding, the contractor should have prior successful experience in revegetating sites with similar conditions and characteristics. Western will first review and approve the contractor's seeding specifications (see example, Appendix N), which shall include a reclamation performance standard of at least 80 percent cover at the end of the first year. In addition, the contractor must use only a weed-free seed mix. The contractor should also provide a program for monitoring of success including inspections and reseeding/repairing if necessary. Seedbed preparation, mulch and fertilizer requirements, and follow-up care responsibilities should also be clearly defined in the contract.

Figure 12-1

Estimated Cost for Increasing Erosion Control Protection

■ Indicates Treatments Usually Effective at Different Slope Angles



Note:

E.C. = Erosion Control

BFM = Bonded Fiber Matrix

Slope Gradient

TABLE 12-2

**SUMMARY OF METHODS AND COSTS
OF COMMON EROSION CONTROL PRACTICES**

| Treatment | | Comment | Potential for Erosion Control & Revegetation Success | Approximate Cost per Acre ¹ |
|-----------|--|--|---|---|
| 1. | Seeds and fertilizer broadcast on the surface, no soil coverage or mulch.** | Not very effective on rough seedbeds with minimum slope and erodibility. Should be used only in areas inaccessible to machinery. | 1 | \$280-400 |
| 2. | Same as #1, seed buried** | More effective than #1 and worth the extra cost for seed burial. | 2 | \$320-450 |
| 3. | Drill seed (assumes seed buried and fertilized) no soil preparation or mulch. | Fast and far more cost effective than broadcast methods. Should be utilized wherever drill seeding equipment is accessible. | 3 | \$185-250 |
| 4. | Same as #3 with soil preparation. | Soil preparation is well worth the investment. | 4-5 | \$225-275 |
| 5. | Hydroseed, fertilize and wood fiber hydromulch and 1600 lb./acre using one-step method.** | Not worth the cost and should be avoided due to the danger of "plant suicide." Hydromulch provides only a minimal mulch effect. | 2 | \$800-1,000 |
| 6. | Same as #5, using two-step method, no seed burial.** | Acceptable method on slopes, tight areas, or for turf or wild flower establishment. | 3-4 | \$825-1,100 |
| 7. | Same as #6, seed buried.** | Well worth the cost for seed burial. Slope seedlings need all the help they can get. Not feasible on very steep slopes. | 4-5 | \$900-1,200 |
| 8. | Same as #6, add organic tackifier at 100 lb./acre to hydromulch.** | Tackifiers worth the investment on steep slopes, windy or highly erodible sites. No increase in labor or machinery costs. | 5-6 | \$1,050-1,350 |
| 9. | Same as #6, add plastic soil stabilizer at 300 gal/acre.** | Good for longer term tackifier requirements. Liquids may be difficult to use in remote areas and in cool weather. | 5-7 | \$1,200-1,600 |
| 10. | Drill seed, fertilize, soil preparation and dry mulched with hay at 1-1/2 ton/acre or straw at 2 ton/acre, mulch crimped in. | Use whenever site conditions allow. May be effectively utilized on slopes 3:1 or greater. Windy sites may be a problem. | 6-8 | \$500-800 |

**TABLE 12-2
(Concluded)**

| | Treatment | Comment | Potential for Erosion Control & Revegetation Success | Approximate Cost per Acre ¹ |
|-----|--|---|--|--|
| 11. | Hydroseed, fertilize, dry mulch at same rates as in #10. Tacked with organic, tackifier at 100 lb/acre and hydromulch at 150 lb/acre with water at 700 gal/acre.** | Cost effective method for anchoring dry mulches on relatively steep slopes. Windy sites still a problem. Far less expensive than nettings. | 5-7 | \$900-1,200 |
| 12. | Hand broadcast seed and fertilizer, dry mulch as in #11. Anchor mulch with plastic erosion control netting.** | Cost effective netting technique for non-critical slopes. Green netting may break down too quickly on south facing slopes. Black netting has a high visual impact. | 5-7 | \$2,200-3,200 |
| 13. | Hand broadcast seed and fertilizer, cover with excelsior erosion control blanketing.** | Good, weed-free mulch adapted to small areas. Green netting still a problem. May not maintain good soil contact on rocky sites. Possible fire hazard. Low visual impact. | 6-8 | \$4,000-6,000 |
| 14. | Hand broadcast seed and fertilizer, anchor with jute netting.** | Good treatment on rocky sites. Possible fire hazard. Higher visual impact. Increasing costs may be cost prohibitive. | 6-8 | \$6,400-7,400 |
| 15. | Hand broadcast seed and fertilizer, dry mulch as in #11. Anchor with jute netting.** | Same as #14. Dry mulch below jute improves soil contact and often is a good investment. | 6-8+ | \$6,700-7,800 |
| 16. | Hand broadcast seed and fertilizer, anchor with an erosion control and revegetation mat (ECRM).** | Very cost effective alternative to riprap, cobble and trickle channels, concrete lined channels and slope paving. Due to extremely high costs ECRMs must be used judiciously. | 9-10 | \$36,300-43,000 |

* 1 = Minimal, 10 = Excellent

** Assume double seeding rate whenever broadcasting or hydroseeding.

¹ 1986 dollars

Source: Theisen 1986.

TABLE 12-3
Summary of Common Mulching Methods

| Method | Advantages | Disadvantages |
|------------------------------|--|--|
| Nurse/Cover Crop | Plant prior to or during planting of selected perennial seed mix. | Timing important, may not fit project schedule. (Must account for growth of nurse crop, in particular). |
| | Cover crop - can plant at same time with seed mix - saves time, money. | Success of mulch depends on success of nurse/cover crop - may need to remulch. |
| | Benefits for soil stabilization (crop roots in place), slow release fertilization, soil conditioning. | Labor intensive (nurse crop) - must be hayed or combined to produce standing stubble. |
| Straw or Hay Mulch | Relatively inexpensive. | Must crimp in to be effective. |
| | Very cost-effective for less steep slopes, flatter areas. | Possibility of getting weed seeds in mulch. |
| | Well known, proven method - easy to obtain, apply. | May not be possible to use on steep slopes (less than 3:1), Can apply too little, too much. Windy sites a problem. |
| Hydromulch (Hydraulic Mulch) | Can be done at same time as seeding, fertilizing (hydro-seeding). | If slope too steep, may be ineffective. Need to add tackifiers or use additional erosion control material. |
| | Inexpensive. | |
| | Can be used on steep slopes or tight areas where cannot reach with other methods. (Although may fail if use without additional erosion control). | (Hydro-seeding): Doesn't place seed <u>into</u> the ground, (although good if seed enhanced by light). |
| | Dye can be used as aesthetic aid (e.g., green color). | Dye can be inappropriate in some locations (visual impact). |

(Beyond mulches are the various erosion control methods - blankets, mats, netting, bonded fiber matrix materials. All of these provide better control, especially on steep slopes, but cost much more in material and labor).

NEW VEGETATION CONTROL METHODS: TREE GROWTH REGULATORS AND BIOLOGICAL BARRIERS

Vegetation management research is continually developing new methods and chemicals for control and manipulation of vegetation, and Western is actively involved in researching and investigating these new methods. In selecting new methods for investigation, Western will consider cost-effectiveness and environmental soundness, i.e., is the method safe for both humans and the environment? Western will be conducting field tests to determine the effectiveness and suitability of new herbicides and/or methods for Western's vegetation management needs. Some of the newer methods that Western now uses are:

- Tree Growth Regulators
- Biological Barriers

Tree Growth Regulators

A tree-growth regulator (TGR) is a specially designed chemical, that, when applied to a tree, controls growth in the tree's crown (branches), thereby reducing the need to top/trim or remove trees. TGRs are particularly useful in areas where there are restrictions on removal, and topping/trimming is undesirable because of anticipated re-sprouting or disfiguration or death of the tree.

The best trees to select for TGR treatment are those which will be trimmed (if they are scheduled to be trimmed) after the chemical has been implanted or applied. This will provide for uptake of the chemical at a more accelerated rate so you can observe results sooner. Another excellent candidate for TGRs is a tree that has never been trimmed, but will reach the wire zone in the next two years. This tree can be regulated in its natural state. The most immediate benefits are seen when TGRs are used on fast-growing trees, large trees, or "cycle busters," that are costly to trim.

The two tree growth regulators currently available for control of aspen and other deciduous species are Profile 2SC[®] and Cutless[®] tree implants. These TGRs have

also shown promising results for growth control of certain conifers. The U.S. Forest Service has tentatively agreed to allow Western to use both Profile® and Cutless® on its land holdings.

Cutless® was the first TGR evaluated by Western. It is labeled for use only as an implant and contains the herbicide flurprimidol. Studies conducted from 1989 to 1992 with flurprimidol have shown significant reductions (50-60+%) in both shoot elongation and in trim and chip time (Redding, Kent D., et al., 1994). For best results, Cutless® implants should be installed just prior to or during the most rapid period of water uptake. Growth suppression may not be noticed until the year following treatment.

Profile® can be applied as a basal soil drench or by soil injection. Treatment of trees less than 4 inches diameter is not recommended. Application can be done throughout the year, except when the soil is frozen or waterlogged.

Biological barriers are geotextile fabrics which either have been impregnated with herbicide nodules or are coated with an anti-germination coating (such as copper hydroxide). They are placed under gravel floors at substations and yards. These biological barriers inhibit the establishment of vegetation by creating a physical barrier that prevents the germination of seeds located under the membrane. In addition, they slowly release herbicides to control vegetation or prevent weed germination without the need for frequent application of chemical sprays or granules. Western has begun to test the efficiency of these barriers at Fort Morgan West Substation and at Weld Substation in the Loveland Area, and will continue to evaluate them in the future. Appendix P provides additional information on Biobarrier® and Tex-R® Industrial.

REFERENCES/CREDITS

The following references were used in preparing this program guidance, and the authors give credit to all of them for use of their materials. Documents from the Bonneville Power Administration, Western's sister organization in DOE, were often borrowed from directly and extensively, and the authors credit Bonneville for many of the items presented herein.

Bonneville Power Administration (BPA). 1985. O&M Danger Tree Selection Criteria. PT 07 03 85-02. November 28. 5pp.

Bonneville Power Administration (BPA). 1994. Pesticide Applicator Course for Line Maintenance Personnel. January 19.

Bonneville Power Administration (BPA). 1994a. Pesticide Applicators Course for Operations Personnel. January 21.

Bonneville Power Administration (BPA). 1994b. Pesticide Fact Sheets. February (Fact sheets issued by the Forest Service, Bureau of Land Management and Bonneville Power Administration.)

Colorado Weed Management Association. No Year. Weed and Pest Management. Basic and Advanced Training School at Greeley, CO., Northeastern Junior College. March 28-31.

Dow Elanco. No Date. Information about Noxious Weeds. 9002 Purdue Road, Indianapolis, IN 46268-1189.

Dow Elanco. No Date. Fact Sheets - Tree Growth Regulators (Unpublished; Provided by Bill Massey, Dow Elanco Representative).

- Ellsworth, D.P. 1993. O&M Danger Tree Selection Criteria. Transmission Maintenance Procedure. PT 07 03 85-02. Division of System Maintenance - Bonneville Power Administration. Revised June 24, 1993.
- Horn, Merlin E. Dr., Principal Investigator. 1994. Vegetation Management by Electric Utilities: Use of Herbicides and Other Methods. A Synthesis Report (Draft). Prepared for the Electric Power Research Institute. Palo Alto, CA. Prepared by Environmental Management Services. February.
- Kansas State University, Cooperative Extension Service. 1988. Industrial Weed Control. Commercial Pesticide Applicator Certification and Recertification. December. Manhattan, KS.
- Nilson, Erick B. 1988. Industrial Weed Control. Commercial Pesticide Applicator Certification and Recertification Study Manual. Kansas State University Cooperative Extension Service, Manhattan, Kansas, December.
- Office of Surface Mining Reclamation and Enforcement. (No Date). Handbook of Western Reclamation Techniques. Western Regional Coordinating Center. Office of Technology Transfer, Denver, Colorado.
- Oregon State University Extension Service. No Date. Applying Pesticides Correctly. A Guide for Commercial Applicators. EM 8392. Corvallis, OR. Reprinted 1991.
- Pennsylvania Power & Light Company (PP&L). 1986. Transmission Line Right-of-Way Program for Vegetation Management. Allentown, PA. November.
- Redding, Kent D. et al. 1994. Growth, Biomass, and Trim/Chip Time Reduction Following Application of Flurprimidol Tree Growth Regulator. Journal of Arboriculture 20(1). January.
- Roybal, Art. 1993. Presentation on the Development and Implementation of Western Area Power Administration's Transmission Facilities Vegetation Management Program. Handouts. Golden, Colorado. November 29.

- Roybal, Art. 1995. Personal Communication. Western Area Power Administration, Office of Environment.
- Theisen, Mark. 1986. Practical Approaches for Cost Effective Erosion Control. Colorado Green. Winter. pp. 16-21.
- U.S. Bureau of Land Management (BLM). 1988. Chemical Post Control. BLM Manual Handbook H-90011-1. Rel. 9-291. May 25.
- U.S. Department of Agriculture (USDA) Forest Service. 1984. Manual of Revegetation Techniques. Prepares. Prepared by Environmental Research & Technology, Inc. Ft. Collins, CO 125 pp.
- U.S. Department of Agriculture (USDA) Forest Service. 1992. Risk Assessment for Herbicide Use in Forest Service Regions 1,2,3,4, and 10 and on Bonneville Power Administration Sites. Prepared under contract number 53-3187-9-30. September.
- U.S. Department of Energy (DOE), Bonneville Power Administration. 1981. BPA Environmental Manual - Pesticides. Chapter 955. BPA 1433. June.
- U.S. Department of Energy (DOE), Bonneville Power Administration. 1983. Final Environmental Impact Statement. Transmission Facilities Vegetation Management Program. Portland, OR. August.
- U.S. Department of Energy (DOE), Western Area Power Administration. 1990. Power System Maintenance Manual. January.
- U.S. Department. of Interior, Bureau of Land Management. 1989. Draft Environmental Impact Statement. Vegetation Treatment on BLM Lands in Thirteen Western States.

U.S. Department. of Interior, Bureau of Land Management. 1991. Final Environmental Impact Statement Vegetation Treatment on BLM Lands in Thirteen Western States. BLM-WY-ES-91-022-4320. Wyoming. May.

U.S. Environmental Protection Agency (EPA). 1987. Protective Clothing for Pesticide Users. AG-MI-3236. University of Minnesota. St. Paul, Minnesota.

U.S. Environmental Protection Agency (EPA). 1990. Suspended, Canceled, and Restricted Pesticides. Prepared by the Office of Compliance Monitoring. Office of Pesticides and Toxic Substances (EN-342). February.

Weed Science Society of America. 1989. Herbicide Handbook. 6th Edition. Champaign, Illinois.

Whitson, Tom D. Steven A. Dewey, Peter K. Fay. (Eds.) 1993-1994. Weed Control Handbook. Montana-Utah-Wyoming. Extension Services of Montana State University, Utah State University, and the University of Wyoming. 210 pp.

APPENDIX A
STATE PESTICIDE REGULATIONS
(Current as of September 1999)

Arizona

Prohibited Pesticides (State)

Krenite® (fosamine ammonium) is not registered for sale or use in Arizona. Otherwise, rely on EPA's Restricted Use listing and the Department of Environmental Quality for agriculture uses.

Special Requirements For Storage, Use and Disposal

R3-3-301 Pesticide Use.

- (a) No person shall use, apply or instruct another to apply a pesticide in a manner or for a use inconsistent with the product label or labeling.
- (b) No persons, other than those making applications pursuant to government sponsored control measures, shall apply, cause or authorize another to apply or cause the direct release of a pesticide spray, dust, or granules such that it comes into contact with persons (other than those involved in the application who are wearing the proper protective clothing and equipment), animals, or property other than the target crop being treated.

R3-3-305 and R3-3-313 Storage and Disposal.

No person shall dump, negligently store or leave unattended any pesticide, or pesticide container or part thereof, at any place or under any condition where it presents a hazard to persons, animals or property.

Pesticide containers can be disposed of at an approved sanitary landfill, owned in accordance with State and local regulations or at a DEQ approved hazardous waste disposal site. The containers must be triple rinsed and rendered incapable of holding liquid prior to disposal. Pesticide containers may be recycled in accordance to label instructions.

Herbicide Use Restrictions To Protect Surface and Groundwater

Yes, only in regard to agricultural uses.

Does the State have a groundwater protection program in regard to herbicides?

Yes, for agricultural uses. State has submitted generic groundwater protection plan to EPA, but it had not been finalized as of 9/99.

Herbicide Regulations Office: Arizona Department of Agriculture Environmental Services Division

Contact Person: Ken Davis Phone: (602) 542-0986

Address: 1688 W. Adams Street, Phoenix, AZ 85007

Pesticide Application Certification: Structural Pest Control Commission

Contact Person: Maria Munoz Phone: (602) 255-3664 x2271

Address: 9545 E. Doubletree Ranch Road
Scottsdale, AZ 85258

California

Prohibited Pesticides (State)

Several herbicides containing imazapyr (trade names Arsenal® (2 lb product), Sahara®, Topsite 2.5G®) are not registered for use in California. However, there are several imazapyr products that became registered in 1998: Arsenal® products registered for forestry use only, and Stalker®, registered for basal cut applications. Krenite® (fosamine ammonium) and Tordon® (picloram) are also not registered for use in California (even though the Tordon label does not indicate this).

Several other herbicides that had not been registered in California have obtained registration in recent years. These include Telar Herbicide®, Telar DF Herbicide®, and Oust®.

Check with the California Pesticide Registration Information Center (916-324-0399) or website (<http://www.cdpr.ca.gov>), if there are any questions about current registration status of a pesticide.

6400 Restricted Materials.

- (a) Any pesticide labeled as a "Restricted Use Pesticide" under Federal law.
- (b) Pesticides containing active ingredients which have the potential to pollute groundwater, listed in section 6800(a), when labeled for agricultural, outdoor institutional, or outdoor industrial use. (see Section 6800, below)
- (c) Certain other pesticides

(Note: Only the herbicides are listed here; see the Pest Control Manual, Appendix A, for a complete listing).

- Acrolein (when labeled as aquatic herbicide).

- Dicamba (Banvel), except:
 - (1) Liquid formulations packaged in containers of one quart or less regardless of percentage of dicamba;
 - (2) Liquid formulations that contain 15 percent or less dicamba packaged in containers of one gallon or less;
 - (3) Liquid formulations of a product that is labeled to be used without further dilution;
 - (4) Dry formulations, packaged in containers of one pound or less, of a product that is labeled to be further diluted for use; and
 - (5) Dry formulations, packaged in containers of 50 pounds or less, of a product that contains 10 percent or less dicamba and is labeled to be used without further dilution.

- 2,4-D, except:
 - (1) Liquid formulations, packaged in containers of one quart or less, regardless of percentage of 2,4-D;
 - (2) Liquid formulations that contain 15 percent or less 2,4-D packaged in containers of one gallon or less;
 - (3) Liquid formulations of a product that is labeled to be used without further dilution;
 - (4) Dry formulations, packaged in containers of one pound or less, regardless of percentage of 2,4-D;
 - (5) Dry formulations, packaged in containers of 50 pounds or less, of a product that contains 10 percent or less 2,4-D and is labeled to be used without further dilution; and
 - (6) Products labeled only for use as a plant growth regulator.

- 2,4-DB, except:
 - (1) Liquid formulations, packaged in containers of one quart or less, regardless of percentage of 2,4-DB;
 - (2) Liquid formulations that contain 15 percent or less 2,4-DB packaged in containers of one gallon or less;

- (3) Liquid formulations of a product that is labeled to be used without further dilution;
 - (4) Dry formulations, packaged in containers of one pound or less, regardless of percentage of 2,4-DB;
 - (5) Dry formulations, packaged in containers of 50 pounds or less, of a product that contains 10 percent or less 2,4-DB and is labeled to be used without further dilution.
- 2,4-DP, except:
 - (1) Liquid formulations, packaged in containers of one quart or less, regardless of percentage of 2,4-DP;
 - (2) Liquid formulations that contain 15 percent or less 2,4-DP packaged in containers of one gallon or less;
 - (3) Liquid formulations of a product that is labeled to be less, without further dilution of 2,4-DP;
 - (4) Dry formulations, packaged in containers of one pound or less, regardless of percentage of 2,4-DP;
 - (5) Dry formulations, packaged in containers of 50 pounds or less, of a product that contains 10 percent or less 2,4-DP and is labeled to be used without further dilution.
- MCPA, except:
 - (1) Liquid formulations, packaged in containers of one quart or less, regardless of percentage of MCPA;
 - (2) Liquid formulations that contain 15 percent or less MCPA packaged in containers of one gallon or less;
 - (3) Liquid formulations of a product that is to be used without further dilution;
 - (4) Dry formulations, packaged in containers of one pound or less, regardless of percentage of MCPA; and
 - (5) Dry formulations, packaged in containers of 50 pounds or less, of a product that contains less than 10 percent or MCPA and is labeled to be used without further dilution.

- Paraquat
- Propanil

6895 Prohibition of Use of Weed Oils.

- (a) No person shall use a weed oil in the counties of Alameda, Contra, Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma, or parts thereof which fall with the Bay Area Air Quality Management District.
- (b) No person shall knowingly sell a weed oil for use in the Bay Area Air Quality Management District.

Special Requirements For Storage, Use, and Disposal

6670 Findings of the Director.

- (a) The director finds that pesticides and used pesticide containers may cause injury to persons, animals, or the environment unless they are stored, transported, handled, or disposed of in a safe manner. These regulations shall be construed to provide positive controls over these chemicals and containers.
- (b) Pesticides, emptied containers, or parts thereof, or equipment that holds or has held a pesticide, shall not be stored, handled, emptied, disposed of, or left unattended in such a manner or at any place where they may present a hazard to persons, animals (including bees), food, feed, crops, or property. The commissioner may take possession of such unattended pesticides or emptied containers to abate such hazard.

Herbicide Use Restrictions to Protect Surface and Groundwater

6800 Groundwater Protection List.

Pesticides labeled for agricultural, outdoor institutional, or outdoor industrial use that contain any of the following chemicals are designated as having the potential to pollute groundwater.

- (1) Atrazine
- (2) Bentazon (Basagran)
- (3) Bromacil
- (4) Diuron
- (5) Prometon
- (6) Simazine

6802 Pesticide Management Zones.

A Pesticide Management Zone is a geographical area of approximately one square mile which is sensitive to groundwater pollution. The Management Zones are listed by County, legal description, and type of pesticides; however, individual counties must be contacted for the most current list.

Does the state have a groundwater protection program in regard to herbicides?

Yes - for agricultural uses.

Miscellaneous Information

6674 Posting of Pesticide Storage Areas.

Signs visible from any direction of probable approach shall be posted around all storage areas where containers which hold or have held pesticides required to be

The notice shall be repeated in an appropriate language other than English when it may reasonably be anticipated that persons who do not understand the English language will come to the enclosure.

Herbicide Registration
Branch - Information
Center:

Colorado

Prohibited Pesticides (State)

None, other than what EPA bans.

Pesticides for Limited Use.

Pesticides containing the following active ingredients when used as herbicides are hereby declared to be pesticides for limited use and shall only be distributed to certified applicators. The pesticides are for retail sale to and use only by certified applicators or persons under their direct supervision.

- | | |
|-----|-------------------|
| (1) | Bromacil |
| (2) | Diuron |
| (3) | Monuron |
| (4) | Prometon |
| (5) | Sodium Chlorate |
| (6) | Tebuthiuron |
| (7) | Sodium Metaborate |
| (8) | Ureabor |

Special Requirements for Storage, Use, and Disposal

Part 11 Storage. (See also Colorado Water Quality Control Act information, under Groundwater Protection Program question, below).

- | | |
|-------|--|
| 11.01 | All licensees shall store pesticide concentrates and dilute mixtures using methods which are reasonably calculated to prevent the contamination of other products by means of volatilization, leakage, breakage, or other causes, and which are reasonably calculated to avoid the creation of an unreasonable risk of harm to |
|-------|--|

persons, property, domestic or wild animals, or the environment.

- 11.03 Indoor storage areas shall be secured from access by unauthorized persons.
- 11.04 Outdoor storage areas shall be fenced or walled and locked.
- 11.05 Pesticide storage areas shall be marked with a sign, in letters at least one inch high, which reads: "WARNING: HAZARDOUS MATERIALS (PESTICIDES) ARE CONTAINED WITHIN. In case of emergency, contact: (name) at (telephone)." Compliance with this rule is not necessary for any person who has marked his storage areas with signs which comply with the local fire department requirements.
- 11.06 Each licensee storing pesticides shall inform the local fire department of the location of the pesticide storage, and shall provide the fire department with material safety data sheets for all pesticides held at the location.
- 11.07 Each licensee who stores pesticides shall have available, at each storage location, in good working order, one or more fire extinguishers rated for chemical fires, and materials for use in cleaning up pesticide spills.

Part 13 Notification.

Any pesticide applicator making an aquatic pesticide application in any body of water with any legal public access shall post a sign notifying the public of the application at each place of legal access.

Part 6 Records.

- 6.01 Licensed commercial applicators shall maintain accurate and legible office records of each application of pesticides made for hire.
- 6.03 Such records shall include all of the following information.
 - (a) Name and address of person for whom application was made.
 - (b) Location where application was made, if different from number 6.03(a).
 - (c) Target pest.
 - (d) Site, or structure treated.
 - (e) Specific pesticide applied.
 - (f) Dilution rate.
 - (g) Application rate.
 - (h) Carrier, if other than water.
 - (i) Date and time for application.

Herbicide Use Restriction to Protect Surface and Groundwater

None beyond restrictions described on the product label.

Does the State have a groundwater protection program in regard to herbicides?

The State has water quality regulations (Water Quality Control Act, Title 25, Article 8) pertaining to commercial fertilizers and pesticides at storage facilities and mixing/loading areas. Secondary containment is required for storage of pesticides/herbicides in bulk in excess of 55 gallons of liquid or 100 lbs dry, in a structure capable of containing 125% of the volume of the largest container in the structure. Mixing and loading pads are required where at least 500 gallons of liquid product or 3,000 pounds of dry product are handled annually, or where 1,500 pounds of active ingredient or a combination of liquid and dry product is handled annually. The rules do not apply to field mixing and loading of pesticides. The State is also developing a generic groundwater management plan.

Herbicide Regulations Office: Colorado Dept. Of Agriculture Division of Plant Industry Pesticide/Applicator Section

Contact Person: Steve Blunt Phone: (303) 239-4140

Address: 700 Kipling St. Suite 4000, Lakewood, CO 80215-5894

Iowa

Prohibited Pesticides (State)

None, other than what EPA bans.

Special Requirements for Storage, Use, and Disposal

21-44.5(206) New Pesticide Storage and Mixing Site Location.

New permanent storage and mixing sites as defined in subrule 44.1(3) shall be selected in accordance with requirements of the Iowa Department of Natural Resources. The new site, if located in a flood plain, shall be protected from inundation from floods. New permanent pesticide storage and mixing sites shall be located a minimum of 400 feet from public water supply wells or below ground level finished water storage facilities and a minimum of 150 feet from private water supply wells.

21-44.6(206) Pesticide Storage and Mixing Site.

Each site shall comply with those ordinances and regulations enacted by the city or county affected by such location that related to the location of such sites. All sites and facilities where flammable pesticides are stored shall comply with State and Federal fire protection rules and regulations, including the National Fire Protection Standards (Standard 30) for storage of flammable liquids.

206-15 Licensee to Keep Records.

The secretary shall require commercial applicators and certified commercial applicators to maintain records with respect to application of pesticides. Such relevant information as the secretary may deem necessary may be specified by regulation. Such records shall be kept for a period of three years from the date of the application of the pesticide to which such records refer, and the secretary shall, upon request in writing, be furnished with a copy of such records forthwith.

21-45.50(206) Notification Requirements for Urban Pesticide Applications.

All commercial or public applicators who apply pesticides within urban areas in municipalities shall post or affix notification signs at the start of the application and for at least 24 hours or longer, if required on the label. The sign shall be of a rain resistant material. Signs shall be in contrasting colors, printed in block letters at least one inch. The following information shall be on the notification sign:

- a) The name and telephone number of the business applying the pesticide; and
- b) The words: "This area chemically treated, keep off. Do not remove sign for twenty-four hours" (or longer if required). As an alternative, a universally accepted symbol having the same meaning or intent may be used.

After the required posting has elapsed, all notification signs should be removed.

Herbicide Use Restrictions to Protect Surface and Groundwater

21-44.52(200) Design Plans and Specifications.

All pesticides containing the active ingredient Atrazine shall be classified as restricted use pesticides. The application rate for the actual active ingredient Atrazine shall be limited to three pounds or less actual active ingredient per acre per calendar year. Pesticides or any other substance containing the active ingredient Atrazine shall not be applied within 50 feet of a sinkhole (outer edge of slope), well, cistern, lake, water impoundment or other similar areas. This includes, but is not limited to, abandoned wells, agricultural drainage wells and drainage well surface inlets and drinking water wells. Pesticides, or any other substance containing the active ingredient Atrazine handled in the original unopened container shall not be mixed, loaded or repackaged within 100 feet of any well, cistern, sinkhole (outer edge of slope), streambed, lake, water impoundment or other similar areas. This includes, but is not limited to, any well, whether in use or abandoned, including agricultural drainage wells and drainage well inlets. The application of

Atrazine shall be limited to no more than one and one-half pounds of the actual active ingredient Atrazine per acre per calendar year in designated Atrazine management areas.

Design plans and specifications for facilities required under these rules shall be submitted to the Iowa Department of Agriculture and Land Stewardship prior to the start of construction, along with certification from a registered engineer (as defined in Iowa Code chapter 114) that the designed facilities will comply with all requirements of these rules.

A person may deviate from the requirements of these rules if such deviations are clearly noted on the design plans and specifications, along with certification from a registered engineer that these deviations will not reduce the effectiveness of the facilities in protecting surface or groundwaters.

Does the State have a groundwater protection program in regard to herbicides?

Have developed a generic State management plan. Already have Groundwater Protection Act (1987) which attached fee to sale of pesticides and fertilizers and created university programs oriented toward groundwater protection.

Herbicide Regulations Office: Iowa Dept. of Agriculture Land Stewardship
Attn: Pesticide Bureau

Contact Person: Jim Ellerhoff Phone: 515-281-8506

Address: Henry A. Wallace Bldg., Des Moines, IA 50319

Kansas

Prohibited Pesticides (State)

2-2471 Rule and Regulation Authority to the Secretary to Limit Pesticide Use.

Notwithstanding the provisions of K.S.A. 1989 Supp. 2-2470, whenever the secretary deems it necessary to preserve the health, safety, and welfare or the natural resources of the State, the secretary is hereby authorized to promulgate rules and regulations imposing limitations on the use of any pesticide in a manner inconsistent with its label or labeling.

4-13-1 Restricted Pesticide Destination.

Any pesticide registered by the secretary under provisions of the "Agricultural Chemical Act of 1947" (K.S.A. 2-2204) as amended or supplemented, which is labeled as a restricted use pesticide by the Federal agency responsible for such classification, shall be registered as a restricted use pesticide under the Kansas Pesticide Law.

Special Requirements for Storage, Use, and Disposal

4-13-18 Disposal of Pesticides and Containers.

Any unused pesticide and any empty pesticide container shall be stored in the same manner as the pesticide involved until such unused pesticide or empty container is disposed of in a manner consistent with technology current at the time of disposal. Questions regarding the latest technology should be directed to the Kansas State Board of Agriculture; Kansas State University, Extension Service; Kansas Department of Health and Environment; or the United States Environmental Protection Agency. No open burning of pesticide containers is allowed.

2-2455 Records.

- (a) Each pesticide business licensee shall make available to the secretary upon request, a copy of any written statement of services or contract, records of all pesticide applications during any specified period, records of all employees who performed any service involving, or in conjunction with, the application of pesticides and any other requested information pertinent to the administration of this act or any rule or regulation adopted hereunder by the board.
- (b) The secretary shall require certified commercial applicators who are not employed by or otherwise acting for a business licensee to maintain records concerning applications of restricted use pesticides. The secretary shall specify by rules and regulations the information to be contained in such records, which shall be maintained for three years from the date of application of the pesticide concerned. Such records shall be open to inspection by the secretary or the secretary's authorized representative during normal business hours, and copies shall be furnished to the secretary or the secretary's authorized representative upon request.

Regulations were established in 1996 regarding what information must be recorded:

- Business name and address
- Pest to be controlled (e.g. brush, insects, etc.)
- Pesticide to be used/quantity/area to be treated
- Pesticide name, EPA Reg. #
- Concentration (rate of application)
- Date, location of application (e.g. pole no.; can use map)
- Signature of person who supervised application
- Wind direction/velocity
- If application was less than labeled rate.

Herbicide Use Restrictions to Protect Surface and Groundwater

Yes, voluntary restrictions on using Atrazine in Delaware R. Basin.

Does the State have a groundwater protection program in regard to herbicides?

Still being developed. So far, expect specific plans to apply only to atrazine.

Herbicide Regulations Office: Kansas State Board of Agriculture Division of Plant Health

Contact Person: Dan Tuggle Phone 785-296-5395

Address: 901 S. Kansas Ave., Topeka, KS 66612-1281

Minnesota

Prohibited Pesticides (State)

None, other than what EPA bans. Any fungicide containing mercury is prohibited.

Special Requirements for Storage, Use, and Disposal

18B.14 Pesticide Storage.

Subdivision 1. Display and Storage.

- (a) A person may store or display pesticides and their containers only in the original container and separated from food, feed, seed, livestock remedies, drugs, plants, and other products or materials stored, displayed, or offered for sale in a manner that prevents contamination which would cause injury or damage to the other products or materials.
- (b) A person may not allow open pesticide containers to be displayed for sale under any circumstances.

Bulk Pesticide Storage.

- (a) Secondary containment is required for storing pesticides in amounts of 500 gallons or more and a pesticide storage permit must be obtained from the commissioner.
- (b) Applications must be on forms provided by the commissioner containing information established by rule. Detailed design plans must accompany the application. The initial application for a permit must be accompanied by the nonrefundable application fee of \$100 for each location where the pesticide is stored.
- (c) Containment areas for liquid bulk pesticide loading sites must meet approved design specifications for materials, size, plumbing, etc.

- (d) The operator of a bulk pesticide storage facility shall prepare a written spill response plan, shall keep on site equipment and supplies for spill clean up, and conduct response training.
- (e) Records of inspections, maintenance, and releases shall be kept on site or at the nearest local office.
- (f) Containers used to store bulk pesticides or pesticide rinsates are considered abandoned if they have been out of service for 6 months because of a weakness or a leak, or for any reason more than one year.

18B.07 Pesticide Use.

Subdivision 1. Pesticide Use.

Pesticides must be applied in accordance with the product label or labeling and in a manner that will not cause unreasonable adverse effects on the environment within limits prescribed by this chapter and FIFRA.

Subdivision 2. Prohibited Pesticide Use.

- (a) A person may not use, store, handle, distribute, or dispose of a pesticide, rinsate, pesticide container, or pesticide application equipment in a manner:
 - (1) that is inconsistent with a label or labeling as defined by FIFRA;
 - (2) that endangers humans, damages agricultural products, food, livestock, fish, or wildlife; or
 - (3) that will cause unreasonable adverse effects on the environment.

- (b) A person may not direct a pesticide onto property beyond the boundaries of the target site. A person may not apply a pesticide resulting in damage to adjacent property.
- (c) A person may not directly apply a pesticide on a human by overspray or target site spray.
- (d) A person may not apply a pesticide in a manner so as to expose a worker in an immediately adjacent, open field.

18B.09 Notification Requirements.

Some cities require any applicator who applies pesticides to turf areas post warning signs on the property. Signs must be at least 15 inches above the grassline, be made of weather-resistant material, and remain in place for up to 48 hours from the time of initial application. The colors, format, and specific language are included in the regulation.

If the pesticide labels prescribe hourly or daily intervals for human reentry following application, the person must post signs in accordance with label requirements.

Herbicide Use Restrictions to Protect Surface and Groundwater

Subdivision 5. Use of Public Water Supplies for Filling Equipment.

A person may not fill pesticide application equipment directly from a public water supply, as defined in section 144.382, unless the outlet from the public water supply is equipped with a back-flow prevention device that complies with the Minnesota Plumbing Code under Minnesota Rules, parts 4715.2000 to 4715.2280.

Subdivision 6. Use of Public Waters for Filling Equipment.

- (a) A person may not fill pesticide application equipment directly from public or other waters in the State, as defined in section 105.37, subdivision 14, unless the equipment contains proper and functioning anti-backsiphoning mechanisms. The person may not introduce pesticides into the application equipment until after filling the equipment from the public waters.
- (b) This subdivision does not apply to permitted applications of aquatic pesticides to public waters.

Subdivision 7. Cleaning Equipment in or Near Surface Water.

- (a) A person may not:
 - (1) Clean pesticide application equipment in surface waters of the State; or
 - (2) Fill or clean pesticide application equipment adjacent to surface waters, ditches, or wells where, because of the slope or other conditions, pesticides or materials contaminated with pesticides could enter or contaminate the surface waters, groundwater, or wells, as a result of overflow, leakage, or other causes.
- (b) This subdivision does not apply to permitted application of aquatic pesticides to public waters.

Does the State have a groundwater protection program in regard to herbicides?

Yes, the Minnesota Groundwater Protection Act of 1989, and a generic State Management Plan.

Herbicide Regulations Office: Minnesota Dept. of Agriculture Agronomy
Services Division

Contact Person: John Sirk Phone: 651-296-4292

Address: 90 W. Plato Blvd., St. Paul, MN 55107

Montana

Prohibited Pesticides (State)

None, other than what EPA bans.

Special Requirements for Storage, Use, and Disposal

Pesticide applicators are required to obtain a license for noncommercial application of EPA restricted herbicides.

Aquatic herbicides are classified as restricted use and require special training.

The use of pesticides may be regulated by local governments and each county should be contacted for specific regulations.

New rule as of 1/14/99 - must undertake an immediate response to pesticide spills according to local emergency operations plans; can contact local emergency operations or state 24-hour number at 406-444-6911. Must report spills to The Department of Agriculture within 48 hours.

Herbicide Use Restrictions to Protect Surface and Groundwater

None, other than what EPA bans.

Does the State have a groundwater protection program in regard to herbicides?

Yes, see Montana Agricultural Chemical Groundwater Protection Act.

A generic plan has been approved by EPA. A State plan is also in place.

Herbicide Regulations Office: Montana Department of Agriculture Agricultural
and Biological of Science Division

Contact Person: Steve Baril Phone: 406-444-2944

Address: P.O. Box 200201; Capital Station, Helena, MT
59620-0201

Nebraska

Prohibited Pesticides (State)

None, other than what EPA bans.

Special Requirements for Storage, Use, and Disposal

Regulated by EPA. FIFRA (EPA) through University of Nevada provides certification training on restricted use. Secondary containment is required for bulk storage of pesticides (greater than 55 gallons).

Herbicide Use Restrictions to Protect Surface and Groundwater

See next question.

Does the State have a groundwater protection program in regard to herbicides?

The State now has authority for its own pesticide program. It has concurrence from EPA on its generic management plan.

Miscellaneous Information

PRIORITY OF POTENTIAL NONPOINT PROBLEM AREAS, GUIDING PRINCIPLES

1. By law, Special Protection Areas (SPA) are to provide for the orderly management of groundwater quality in areas where available data, evidence, and other information indicate that the use of groundwater is currently, or potentially, being impaired by nonpoint source contamination.

Definitions:

Special Protection Areas - means any area designated as such by the Directory because of the occurrence or potential occurrence of nonpoint source groundwater contamination.

Pesticides - An agent used to destroy pests. A ranking system for pesticides in Nebraska, based on health effects, groups pesticides into three categories: 1) Class I-greatest health threat in classification; 2) Class II-less of a threat than Class I; and 3) Class III-classifications with the least health threat.

Pesticide Classification Scheme

| <u>Oral LD50 (mg/kg)</u> | <u>Pesticide Class</u> |
|--------------------------|------------------------|
| ≤79 | I |
| 80-899 | II |
| >900 | III |

An LD50 value is the milligrams (mg) of pesticide per kilogram (kg) of body weight of test species necessary to kill 50 percent of the said species test population. Groupings of pesticides based on this classification scheme are presented in Table 1.

Table 1. Pesticide Grouping (Classes) Based on Oral LD50

| <u>Class I</u> | <u>Class II</u> | <u>Class III</u> |
|----------------|-----------------|-----------------------|
| Aldicarb | Bronioyxnil | *#Alachlor |
| #Benefin | Carbaryl | *#Atrazine |
| Carbofuran | Chlorpyrifos | Benomyl |
| Crotoxyphos | *#Cyanazine | #Bentazon |
| Dichlorvos | #2,4-D | #Bifenox |
| Disulfoton | #Diallate | *#Butylate |
| #Endothal | Diazinon | Captan |
| Endrin | Dimethoate | #Chloramben |
| Ethoprop | Lindane | Chlorothalonil |
| Famphur | #Paraquat | #Cycloate (continued) |

| <u>Class I</u> | <u>Class II</u> | <u>Class III</u> |
|----------------|-----------------|--------------------|
| *Fonofos | | #Dalapon |
| Isofenphos | | #Desmidipham |
| Methidathion | | #Dicamba |
| Parathion | | #Dinitramine |
| Phorate | | #EPTC |
| Terbufos | | #Ethofumesate |
| Toxaphene | | Malathion |
| Warfarin | | *#Metolachlor |
| | | #Metribuzin |
| | | PCNB |
| | | #Pendimethalin |
| | | Perniethrin |
| | | #Phenmedipham |
| | | #Picloram |
| | | Piperonyl Butoxide |
| | | #Propachlor |
| | | #Propham |
| | | #Pyrazon |
| | | #R-25788 |
| | | #Simazine |
| | | #Sodium Chlorate |
| | | Stirofos |
| | | #Terbutryn |
| | | *#Trifluralin |

* - Pesticides already detected in Nebraska's groundwater.

- Herbicides

Herbicide Regulations Office: Department of Agriculture Bureau of Plant Industry

Contact Person: Tim Creger Phone: 402-471-2394

Address: P.O. Box 94756, Lincoln, NE 68509

Nevada

Prohibited Pesticides (State)

None, other than what EPA bans.

State Restricted Use Herbicides:

Herbicides

Acrolein (magnacide)
Alachlor (Lasso)
Allyl Alcohol
Amitrol (Except homeowner formulations)
Atrazine
Arsenic Acid
Bis(tributyltin)oxide
Bromoxynil (Buctril)
Cyanazine (Bladez)
Diallate (Avadex)
Diclofop (Bladex)
Pronamide
Sulfuric Acid

Wood Preservatives

Pentachlorophenol

Special Requirements for Storage, Use, and Disposal

Label instructions must be followed. Person must be certified. The only requirement for restricted use pesticide is to obtain a certificate from their office.

All services containers of operators working in the field of urban pest control must bear the following labels, securely attached to the containers:

- Name, address and telephone number of the business
- Name of pesticide
- EPA registration number, a State department of agriculture number
- Name and percentage of active ingredient
- Precautionary word from label

All other containers must bear the original label. A complete label must be carried in the vehicle for each pesticide in the vehicle.

Hazardous and Injurious Pesticides: Warnings; Applications

1. All persons engaged in the application of a pesticide which contains carbon bisulfide, chlorate compounds, petroleum oil, sulfur dust, or other flammable or explosive materials shall take reasonable precautions to prevent creating a fire during the application and to provide an adequate warning of such a hazard after the application.
2. After any pesticide containing parathion, methyl parathion or EPN is applied at a rate per acre greater than 1 pound of actual parathion, methyl parathion or EPN, singly or in combination, a posted notice must be kept on the treated property for 2 weeks to provide adequate warning to persons who enter the property by the point or points of

normal entry. The notice must be of such size that it is readable at a distance of 25 feet and must be substantially as follows:

WARNING: DO NOT ENTER THIS PROPERTY
TREATED WITH (PARATHION) (METHYL
PARATHION) (EPN) ON (date)
ALL PERSONS WARNED TO STAY OUT FOR 2 WEEKS.

Herbicide Use Restrictions to Protect Surface and Groundwater

None other than EPA restrictions.

Does the State have a groundwater protection program in regard to herbicides?

Nevada is currently working on a management plan.

Herbicide Regulations Office: Nevada State Dept. of Agriculture State Division
of Plant Industry

Contact Person: Charles (Chuck) Moses Phone: 775-688-1180
x 251

Address: 350 Capitol Hill Ave., Reno, NV 89502

New Mexico

Prohibited Pesticides (State)

In order to prevent unreasonable adverse effects on the environment, all formulations of the herbicide and pesticides listed in this section shall be classified for restricted use in New Mexico, provided their labels or labeling contain directions primarily for the use on agronomic crops, range or pasture lands, rights-of-way, forest, or non-croplands. Those products labeled primarily for use in ornamental, turf, or home garden plantings shall remain unclassified.

Herbicides (Banned if banned by EPA)

Common name/chemical name:

- a. 2,4-D/2,4-Dichlorophenoxyacetic acid.
- b. 2,4-DB/4-Dichlorophenoxybutyric acid.
- c. 2,4-5-T/2,4,5-Trichlorophenoxyacetic acid (use prohibited at Federal level).
- d. Silvex/2-(2,4,5-Trichlorophenoxy) propionic acid (use prohibited at Federal level).

Pesticides - State follows Federal restricted use list. (Pesticides (insecticides) are no longer restricted at the State level.)

Special Requirements for Storage, Use, and Disposal

76-4-30 Discarding and Storing of Pesticides and Pesticide Containers.

No person shall discard, transport or distribute any pesticide or pesticide container in a manner that may cause injury to humans, vegetation, crops, livestock, wildlife or beneficial insects or pollute any waterway.

76-4-33 Records.

- (a) Any person issued a license or permit under the provisions of the Pesticide Control Act (76-4-1 to 76-4-39 NMSA 1978) shall keep such records as required by regulation of the Board.
- (b) Commercial pesticide applicators licensed under the provisions of the Pesticide Control Act shall keep such records as prescribed by regulation of the Board.
- (c) The department shall have access to the records at any reasonable time to copy or make copies of the records for the purpose of carrying out the provisions of the Pesticide Control Act. Unless required for the enforcement of the Pesticide Control Act, the information shall be confidential, and if summarized, shall not identify any individual person.

Herbicide Use Restrictions to Protect Surface and Groundwater

None.

Does the State have a groundwater protection program in regard to herbicides?

Generic management plan has been finalized for approval.

Herbicide Regulations Office: New Mexico Dept. of Agriculture Bureau of Pesticide Management

Contact Person: Doug Henson Phone: 505-646-2133

Address: P.O. Box 30005/MSC 3AQ, Las Cruces, NM 88003

North Dakota

Prohibited Pesticides (State)

None, other than what EPA bans.

Amber has limited use restrictions along rivers, streams, wells, etc.

Special Requirements for Storage, Use, and Disposal

4-35-20 Discarding and Storing of Pesticides, Pesticide Containers, and Pesticide Rinsate.

No person may discard, store, display, or permit the disposal of surplus pesticides, empty pesticide containers and devices, or pesticide rinsate in such a manner as to endanger the environment or to endanger food, feed, or any other products that may be stored, displayed, or distributed with such pesticides. The board shall promulgate regulations governing the discarding, storage, display, or disposal of any pesticide, pesticide rinsate, pesticide containers, or devices.

60-03-01-06 Application, Storage, and Disposal of Pesticide.

1. Application.
 - a. All pesticides shall be used in accordance with the label.
 - b. Pesticide applicators and persons assist with an application shall follow all safety precautions as specified on the container label.
 - c. All equipment used in pesticide application must be operationally sound and properly calibrated to prevent unreasonable adverse affects on the government.
 - d. All pesticides that require posting on the label or with a forty-eight-hour-reentry period or greater must be posted by the applicator or the applicator's designate under contract. The signs must be a minimum of eight inches by eleven inches with

one-half-inch lettering and be easily readable. The signs must be posted at all normal entrances to the field and on all corners which are along normally traveled roads. These signs can be a maximum of one-half mile apart. The sign must contain the following information: Danger field sprayed with (pesticide name). The field is safe for reentry on (date).

2. Storage.

- a. All pesticides, except bulk pesticides, shall be stored in their original container and in accordance with label recommendations. All labels of stored pesticides shall be plainly visible. All pesticide containers must have a proper label affixed to them.
- b. All pesticides shall be stored in dry, well-ventilated spaces, and in a manner which will not endanger humans, animals, or the environment, nor contaminate food or feed.
- c. If a storage area contains a floor drain, it must be sealed or self-contained.

3. Disposal.

- a. Empty pesticide containers shall be stored in accordance with label recommendations and in a manner which will not endanger humans, animals, or the environment.
- b. Empty nonreturnable pesticide containers shall be triple-rinsed or equivalent. Secondary use of such containers which would endanger humans, animals, or the environment is prohibited.
- c. Pesticide containers shall be disposed of in accordance with label directions and in a manner which will not endanger humans, animals, or the environment.

60-03-01-10 Storage and Transportation of Bulk Pesticides for Each Business Location.

All permanent bulk storage containers must be equipped with a locking withdrawal valve or must be stored in a secure locked area.

Liquid bulk pesticide:

Outdoor storage:

1. Liquid bulk pesticide storage containers must be on a site which has an additional containment structure with a containment capacity of a minimum of one hundred twenty-five percent of the single largest bulk pesticide storage container.
2. Contaminated rainwater must be collected within this structure.

Indoor storage: Storage facilities located within an enclosed structure must be on a site which has an additional containment structure.

Dry bulk pesticides:

Outdoor storage facilities:

1. Bulk dry pesticide storage facilities must have a six inch (15.24 centimeter) high curb as an additional containment structure. No storage container may be placed closer than three feet (91.44 centimeter) from the curb.
2. Contaminated rainwater must be collected within this structure.

Indoor storage facilities: Storage facilities located in an enclosed structure must have a minimum of a six-inch (15.24-centimeter) curb as an additional containment structure. No storage container may be placed closer than three

feet (91.44 centimeters) from the curb, except where the curb is adjacent to a facility wall.

Herbicide Use Restrictions to Protect Surface and Groundwater

None, other than on label. Should be completed soon.

Does the State have a groundwater protection program in regard to herbicides?

Being developed.

Herbicide Regulations Office: North Dakota Dept. of Agriculture Pesticide Division

Contact Person: Jeff Olson Phone: 1-800-242-7535
701-224-2231

Address: 600 E. Blvd. State Capitol, 6th Floor, Bismarck,
ND 50505-0020

South Dakota

Prohibited Pesticides (State)

None, other than what EPA bans.

Special Requirements for Storage, Use, and Disposal

Storage and Disposal.

A person shall not construct a bulk pesticide storage facility, for the storage of permanent bulk pesticide storage containers (capable of holding more than 300 gallons), without a means of secondary containment. Plans and specifications for the facility must be submitted to the Secretary of Agriculture for review and approval prior to construction.

After February 21, 1995, operational area requirement is required for any one or more of the following:

- (1) more than a total of 1,500 lbs. of pesticide active ingredient;
- (2) pesticides are cleaned from containers or equipment for over 30 days per year;
- (3) the operational area is within;
 - a) 150 feet of a lake, stream, streambed, or wetland;
 - b) 150 feet of a well;
 - c) 200 feet of commercial or residential premises;
 - d) 500 feet of a well used as a public water supply;

After February 1995, additional containment requirements will be required to contain discharges of pesticides and rinsates.

Also, at this time, all applicators will be required to have pesticide handling and discharge response procedures and plans, and provide annual training on this plan to all employees who use and handle pesticides.

Pesticides may be disposed of by using them for the legal purpose originally intended or returning to manufacturer.

Empty containers must be triple rinsed with the rinsate properly reused as diluent or disposed of. A triple rinsed container may be sold for reconditioning, crushed and sold for scrap or disposed of in a sanitary landfill.

Empty containers may be recycled when they meet the following requirements:

- (1) Triple rinsed or the equivalent.
- (2) Consist of high density polyethylene plastic of 2-1/2 gallon capacity or less.
- (3) No visible pesticide residue inside or outside of the container.
- (4) Contain no more than 0.5 fluid ounces of clear water.
- (5) When possible, be delivered with labels on the container.

No person may dispose of any pesticide, pesticide container, or pesticide container residue so as to cause or allow:

- (1) open dumping,
- (2) open burning,
- (3) water dumping,
- (4) or storage next to food or other articles intended for consumption by humans or animals.

Responsibilities of Certified Applicators.

A certificate or pocket card will be issued to each person who satisfactorily completes the requirements of certification and/or licensing. This card is to be presented to the dealer for proof of current certification to purchase restricted use pesticides. In the case of commercial applicator certification, the dealer will check your card for certification in the proper category to determine your eligibility to purchase and use a particular pesticide.

Herbicide Use Restrictions to Protect Surface and Groundwater

Not beyond label instruction.

Does the State have a groundwater protection program in regard to herbicides?

Generic plan has been submitted.

Herbicide Regulations Office: South Dakota Dept. of Agriculture Division of
Regulatory Services Office of Agronomy Services

Contact Person: Brad Berven Phone: 605-773-3724

Address: 445 E. Capitol, Pierre, SD 57501

Texas

Prohibited Pesticides (State)

Chlordane; any pesticides banned by EPA (e.g., 2,4,5-T)

State Limited Use Pesticides/Herbicides

2,4-D, 2,4-DB, 2,4-DP, MCPA, Dicamba, Propanil, Arsenic Acid, Bromacil, Prometon

Special Requirements For Storage, Use, and Disposal

Section 7.21 Storage and Disposal of Pesticides.

- (a) No person may dispose of, discard, or store any pesticide or pesticide container in a manner that may cause or result injury to humans, vegetation, crops, livestock, wildlife, pollinating insects, or pollution of any water supply or waterway.
- (b) Pesticides intended for distribution or sale must be displayed or stored within an enclosed building or fenced area, and may not be displayed on sidewalks, parking lots, or similar open areas without surveillance.
- (c) Pesticides in leaking, broken, corroded, or otherwise unsafe containers, or with illegal labels shall not be displayed or offered for sale. Such containers will be handled in a manner to prevent environmental contamination prior to proper disposal or return to manufacturer.
- (d) Pesticide containers, concentrates, spray mixes, container rinsate, and/or spray system rinsates that are to be discarded shall be disposed of in accordance with pesticide label directions or in accordance with the provisions of the Texas Solid Waste Disposal Act (Texas Civil Statutes Article 4477-7).
- (e) The applicator, the owner of the pesticide, and/or the person in control of the mixing site, shall be jointly and severally liable for proper storage and disposal of pesticide containers and contents. It will be

acceptable for any one of the parties involved to assume liability for compliance.

- (f) All pesticide dealers shall have a list of poison control centers in the State to contact in the case of pesticide poisoning. Must be certified to use a certain herbicide.

Herbicide Use Restrictions to Protect Surface and Groundwater

State regulates hormone type herbicides. Permits required in certain counties for application of regulated herbicides—regulate types of application, products, location of application, and time of year when applied applications of regulated herbicides by brush, mop, wick, basal treatment, or injection method are exempt from the requirements of obtaining a permit.

Does the State have a groundwater protection program in regard to herbicides?

Some herbicides may be restricted later. None now except for labels restrictions.

Generic plan submitted to EPA. There may be some county-level regulations.

*Texas has separate herbicide and pesticide regulations.

Herbicide Regulations Office: Text Dept. of Agriculture Pesticide Regulation Division

Contact Person: Phil Tham Phone: 512-475-1626

Address: P.O. Box 12847, Austin, TX 78711

Groundwater Regulations: Texas Natural Resource Conservation Commission

Contact Person: Annie Tyrone Phone: 512-239-4509

Address: P. O. Box 13087, Austin, TX 78711

Utah

Prohibited Pesticides (State)

None, other than what EPA bans.

Special Requirements for Storage, Use, and Disposal

None.

R68-07-04 Classification of Pesticides.

The Commissioner shall classify all pesticide products registered in Utah for "restricted use" or "general use" according to standards consistent with Section 3 of FIFRA. The Commissioner shall consider as a minimum all pesticides and uses classified as restricted by EPA to be restricted in the State of Utah. He may restrict the use of additional pesticides if he finds that the characteristics of such pesticides require that their uses be restricted to prevent damage to property other than the property to which they are directly applied or to persons, animals, crops or vegetation other than the pests which they are intended to destroy. Individuals not appropriately certified are prohibited from using restricted use pesticides, with the exception of those exempted in Section 6.a.(b) of these rules and competent individuals working under the direct supervision of a certified private applicator.

R68-7-10 Storage and Disposal of Pesticides and Pesticide Containers.

No person shall transport, store, or dispose of any pesticide or pesticide containers in such a manner as to cause injury to humans, vegetation, crops, livestock, wildlife, beneficial insects or to pollute of any waterway in a manner harmful to any wildlife therein.

Herbicide Use Restrictions to Protect Surface and Groundwater

None beyond label requirements. There is an applied endangered species plan that relates to the use of pesticides (1/1/97).

Does the State have a groundwater protection program in regard to herbicides?

A generic plan has been approved by the EPA, will be starting plans for specific pesticides in the near future.

R68-7-11 Unlawful Acts.

- Refused or neglected to keep and maintain the required records.
 - For a employer of a non-commercial applicator to allow an employee to apply any pesticide before that individual has successfully completed the certification procedures.
 - For a pesticide applicator not to have in possession a current copy of their license.
-

Herbicide Regulations Office: Plant Industry

Contact Person: Clark Burgess Phone: 801-538-7188

Address: 350 N. Redwood Road, Box 146500, Salt Lake City, UT 84114-6500

Wyoming

Prohibited Pesticides (State)

None, other than what EPA bans.

Special Requirements for Storage, Use, and Disposal

Storage and Disposal of Pesticides and Pesticide Containers.

- (a) All certified pesticide applicators shall store all pesticide concentrates and dilute mixtures using methods which are reasonably calculated to prevent the contamination of other products by means of volatilization, leakage, breakage, or other causes, and which are reasonably calculated to avoid the creation of an unreasonable risk of harm to persons, property, domestic/wild animals, or the environment.
- (b) Pesticide storage areas shall be kept clean and orderly, and pesticide containers shall be positioned so that they are not exposed to unreasonable risk of damage to the containers or their labels.
- (c) Pesticides and pesticide containers shall be covered or otherwise protected from the elements, in a manner which is reasonably calculated to minimize the risk of damage to labels, and to avoid the creation of an unreasonable risk of harm to persons, property, or domestic/wild animals.

Use label for application. Licensing of applicators is required.

Herbicide Use Restrictions to Protect Surface and Groundwater

No. Use label instructions.

Does the State have a groundwater protection program in regard to herbicides?

A generic management plan has been finalized.

Herbicide Regulations Office: Wyoming Dept. of Agriculture Director of Technical Services

Contact Person: Jim Bigelow Phone: 307-777-6590

Address: 2219 Carey Ave., Cheyenne, WY 82002-0100

APPENDIX B
STATE NOXIOUS WEED REGULATIONS
(Current as of September 1999)

STATE NOXIOUS WEED REGULATIONS

Arizona

State Regulation for Noxious Weed Management

Noxious Weed Regulations; State Noxious Weed List (By Categories*)

Regulated Noxious Weeds

Common Name

Scientific Name

Southern Sandbur
Field Sandbur
Field Bindweed
Burclover
Common Purslane
Puncture-vine

Cenchrus echinatus L.
Cenchrus incertus M.A. Curtis
Convolvulus arvensis L.
Medicago polymorpha L.
Portulaca oleracea L.
Tribulus terrestris L.

Restricted Noxious Weeds

Common Name

Scientific Name

Russian Knapweed
Jointed Goatgrass
Camelthorn
Globe-podded Hoarycress (Whitetop)
Diffuse Knapweed
Spotted Knapweed
Yellow Starthistle
Dodder
Quackgrass
Halogeton

Texas Blueweed
Three-lobed Morning-glory
Dalmation Toadflax

Scotch Thistle

Acroption repens (L.) DC.
Aegilops cylindrica Host.
Alhagi pseudalhagi (Bieb.) Desv.
Cardaria draba (L.) Desv.
Centaurea diffusa L.
Centaurea maculosa L.
Centaurea solstitialis L.
Cuscuta spp.
Elytrigia repens (L.) Nevski
Halogeton glomeratus
(M.Bieb.) C.A. Mey
Helianthus ciliaris DC.
Ipomoea triloba L.
Linaria genistifolia subsp.
dalmatica
Onopordum acanthium L.

Prohibited Noxious Weeds

Common Name

Scientific Name

| | |
|-----------------------------------|--|
| Russian Knapweed | <i>Acroptilon repens</i> (L.) |
| Jointed Goatgrass | <i>Aegilops cylindrica</i> Host. |
| Camelthorn | <i>Alhagi pseudalhagi</i> |
| Alligatorweed | <i>Alternanthera philoxeroides</i> (Mart.) Griseb. |
| Lens-podded Hoarycress | <i>Cardaria chalepensis</i> (L.) Hand-Muzz. |
| Globed-podded Hoarycress | <i>Cardaria draba</i> (L.) |
| Hairy White-top | <i>Cardaria pubescens</i> (C.A.Mey.) Jarmolenko |
| Plumless Thistle | <i>Carduus acanthoides</i> L. |
| Southern Sandbur | <i>Cenchrus echinatus</i> L. |
| Field Sandbur | <i>Cenchrus incertus</i> |
| Purple Starthistle | <i>Centaurea calcitrapa</i> L. |
| Iberian Starthistle | <i>Centaurea iberica</i> Trev.ex.Spreng. |
| Sicilian Starthistle | <i>Centaurea sulphurea</i> L. |
| Yellow Starthistle | <i>Centaurea solstitialis</i> L. |
| Diffuse Knapweed | <i>Centaurea diffusa</i> L. |
| Spotted Knapweed | <i>Centaurea maculosa</i> L. |
| Squarrose Knapweed | <i>Centaurea squarrosa</i> Willd. |
| Rush Skeletonweed | <i>Chondrilla juncea</i> L. |
| Canada Thistle | <i>Cirsium arvense</i> (L.) Scop. |
| Field Bindweed | <i>Convolvulus arvensis</i> L. |
| Creeping Wartcress | <i>Coronopus squamatus</i> (Forsk.) Ascherson |
| Dudaim Melon (Queen Anne's Melon) | <i>Cucumis melo</i> L. var. <i>dudaim</i> Naudin |
| Dodder | <i>Cuscuta</i> spp. |
| Alfombrilla (Lightningweed) | <i>Drymaria arenarioides</i> H.B.K. |
| Anchored Waterhyacinth | <i>Eichornia azurea</i> (SW) Kunth. |
| Quackgrass | <i>Elytrigia repens</i> L. |
| Leafy Spurge | <i>Euphorbia esula</i> L. |
| Halogeton | <i>Halogeton glomeratus</i> |
| Texas Blueweed | <i>Hellanthus ciliaris</i> |
| Hydrilla (Florida-elodea) | <i>Hydrilla verticillata</i> Royale |
| Morning Glory ¹ | <i>Ipomoea</i> spp. |
| Burclover | <i>Medicago polymorpha</i> L. |
| Serrated Tussock | <i>Nassella trichotoma</i> (Nees.) Hack |
| Scotch Thistle | <i>Onopordum acanthium</i> L. |
| Branched Broomrape | <i>Orobanche ramosa</i> L. |
| Torpedo Grass | <i>Panicum repens</i> L. |
| African Rue | <i>Peganum harmala</i> L. |
| Common Purslane | <i>Portulaca oleracea</i> L. |
| Austrian Fieldcress | <i>Rorippa austriaca</i> (Crantz) Bess. |

1

All species prohibited except *Ipomoea carnea*, Mexican Bush Morning Glory, *Ipomoea triloba*, Three-lobed Morning Glory (which is considered a Restricted Pest); and *Ipomoea arborescens*, Morning Glory Tree.

Common Name

Scientific Name

Tansy Ragwort
Carolina Horsenettle
Perennial Sowthistle
Tropical Soda Apple
Puna Grass
Witchweed
Water chesnut
Puncturevine

Senecio jacobaea L.
Solanum carolinense L.
Sonchus arvensis L.
Solanum viarum Dunal
Stipa brachychaeta Godr.
Striga spp.
Trapa natans L.
Tribulus terrestris L.

***Categories:**

Regulated = exotic plant species found within Arizona that may be controlled to prevent further infestation or contamination; have undesirable characteristics and economic environmental significance.
Restricted = exotic plant species found with Arizona that shall be quarantined to prevent further infestation or contamination.
Prohibited = exotic plant species that are prohibited from entering Arizona.

Office: Arizona Department of Agriculture, Plant Services Division

Contact Person: Glenn Thackston, IPM Program Manager

Phone: (602) 542-0972

Address: 1688 W. Adams St., Phoenix, AZ 85007

STATE NOXIOUS WEED REGULATIONS

California

State Regulation for Noxious Weed Management

California Food and Agricultural Code

| <u>Common Name</u> | <u>Scientific Name</u> | <u>Rating</u> |
|-------------------------------------|---|---------------|
| Kangaroothorn | <i>Acacia paradoxa</i> (<i>A.armata</i>) | B |
| Biddy biddy | <i>Acaena anserinifolia</i> | A |
| Biddy biddy | <i>Acaena novae-zelandiae</i> (<i>A. anserinifolia</i>) | A |
| Biddy biddy | <i>Acaena pallida</i> (<i>A. anserinifolia</i>) | A |
| Puna grass | <i>Achnatherum brachychaetum</i> (<i>stipa brachychaeta</i>) | A |
| Russian knapweed | <i>Acroptilon repens</i> (<i>Centaurea repens</i>) | B |
| Jointed goatgrass | <i>Aegilops cylindrica</i> | B |
| Ovate goatgrass | <i>Aegilops ovata</i> (<i>A. geniculata</i> & <i>A. neglecta</i>) | B |
| Barb goatgrass | <i>Aegilops triuncialis</i> | B |
| Rough jointvetch | <i>Aeschynomene rudis</i> | B |
| Carnelthorn | <i>Alhagi maurorum</i> (<i>A. pseudalhagi</i>) | A |
| Panicled onion | <i>Allium paniculatum</i> | B |
| Wild garlic | <i>Allium vineale</i> | B |
| Alligatorweed | <i>Alternanthera philoxeroides</i> | A |
| Giant ragweed | <i>Ambrosia trifida</i> | B |
| Bladderflower | <i>Araujia sericofera</i> | B |
| Capeweed, as seed or fertile plants | <i>Arctotheca calendula</i> | A |
| Lens-podded hoary cress | <i>Cardaria chalepensis</i> | B |
| Heart-podded hoary cress | <i>Cardaria draba</i> | B |
| Globe-podded hoary cress | <i>Cardaria pubescens</i> | B |
| Plumeless thistle | <i>Carduus acanthoides</i> | A |
| Musk thistle | <i>Carduus nutans</i> | A |
| Italian thistle | <i>Carduus pycnocephalus</i> | C |
| Italian thistle | <i>Carduus tenuiflorus</i> | C |
| Smooth distaff thistle | <i>Carthamus baeticus</i> | B |
| Woolly distaff thistle | <i>Carthamus lanatus</i> | B |

| <u>Common Name</u> | <u>Scientific Name</u> | <u>Rating</u> |
|---------------------------|---|---------------|
| Whitestem distaff thistle | <i>Carthamus leucocaulos</i> | A |
| Southern sandbur | <i>Cenchrus echinatus</i> | C |
| Coast sandbur | <i>Cenchrus incertus</i> | C |
| Mat sandbur | <i>Cenchrus longispinus</i> (C. pauciflorus) | C |
| Purple starthistle | <i>Centaurea calcitrapa</i> | B |
| Diffuse knapweed | <i>Centaurea diffusa</i> | A |
| Iberian starthistle | <i>Centaurea iberica</i> | A |
| Spotted knapweed | <i>Centaurea maculosa</i> | A |
| Yellow starthistle | <i>Centaurea solstitialis</i> | C |
| Squarrose knapweed | <i>Centaurea squarrosa</i> | A |
| Sicilian starthistle | <i>Centaurea sulphurea</i> | B |
| Skeletonweed | <i>Chondrilla juncea</i> | A |
| Purple mustard | <i>Chorispura tenella</i> | B |
| Canada thistle | <i>Cirsium arvense</i> | B |
| Yellowspine thistle | <i>Cirsium ochrocentrum</i> | A |
| Wavyleaf thistle | <i>Cirsium undulatum</i> | A |
| Field Bindweed | <i>Convolvulus arvensis</i> | C |
| Swinecress | <i>Coronopus squamatus</i> | B |
| Bearded creeper | <i>Crupina vulgaris</i> | A |
| Dudaim melon | <i>Cucumis melo</i> var. <i>dudaim</i> | A |
| Paddy melon | <i>Cucumis myriocarpus</i> | B |
| Giant dodder | <i>Cuscuta reflexa</i> | A |
| Dodder | <i>Cuscuta</i> spp. (except <i>C. reflexa</i>) | C |
| Artichoke thistle | <i>Cynara cardunculus</i> | B |
| Bermuda grass | <i>Cynodon</i> spp. & hybrids | C |
| Yellow nutsedge | <i>Cyperus esculentus</i> | B |
| Purple nutsedge | <i>Cyperus rotundus</i> | B |
| Scotch broom | <i>Cytisus scoparius</i> | C |
| Quack grass | <i>Elytrigia repens</i> (<i>Agropyron repens</i>) | B |
| Leafy spurge | <i>Euphorbia esula</i> | A |
| Oblong spurge | <i>Euphorbia oblongata</i> | B |
| Serrate spurge | <i>Euphorbia serrata</i> | A |
| Scarlet gaura | <i>Gaura coccinea</i> | B |
| Scented gaura | <i>Guara drummondii</i> (<i>G. odorata</i>) | B |
| Wavyleaf gaura | <i>Gaura sinuata</i> | B |
| French broom | <i>Genista monspessulana</i> (<i>Cytisus monspessulanus</i>) | C |
| Baby's Breath | <i>Gypsophila paniculata</i> | |
| Russian salttree | <i>Halimodendron halodendron</i> | A |
| Halogeton | <i>Halogeton glomeratus</i> | A |
| Bluweed | <i>Helianthus ciliaris</i> | A |

| <u>Common Name</u> | <u>Scientific Name</u> | <u>Rating</u> |
|---------------------------|--|---------------|
| Tanglehead | <i>Heteropogon contortus</i> | A |
| Hydrilla | <i>Hydrilla verticillata</i> | A |
| Black henbane | <i>Hyoscyamus niger</i> | C |
| Klamath weed | <i>Hypericum perforatum</i> | C |
| Satintail | <i>Imperata brevifolia</i> | B |
| Douglas iris | <i>Iris douglasiana</i> | C |
| Western blue flag | <i>Iris missouriensis</i> | C |
| Dyer's woad | <i>Isatis trinctoria</i> | B |
| Poverty weed | <i>Iva axillaris</i> | C |
| Perennial peppercress | <i>Lepidium latifolium</i> | B |
| Dalmatian toadfla | <i>Linaria genistifolia</i> spp. <i>dalmatica</i> (<i>L. dalmatica</i>) | A |
| Purple loosestrife | <i>Lythrum salicaria</i> | B |
| Alkali mallow | <i>Malvella leprosa</i> (<i>sida leprosa</i> var. <i>hederacea</i>) | C |
| Nimblewill | <i>Muhlenbergia schreberi</i> | B |
| False garlic | <i>Nothoscordum inodorum</i> | B |
| Banana waterlily | <i>Nymphaea mexicana</i> | B |
| Onopordum thistles | <i>Onopordum</i> spp. | A |
| Cooper's broomrape | <i>Orobancha ludoviciana</i> var. <i>O. copperi</i> | A |
| Desert broomrape | <i>Orobancha ludoviciana</i> var. <i>O. multiflora</i> | A |
| Branched broomrape | <i>Orobancha ramosa</i> | A |
| Red rice | <i>Oryza rufipogon</i> | |
| Blue panic grass | <i>Panicum antidotale</i> | B |
| Harmel | <i>Peganum harmala</i> | A |
| Kikuyugrass | <i>Pennisetum clandestinum</i> | C |
| Smooth groundcherry | <i>Physalis virginiana</i> var. <i>sonorae</i> (<i>P. subglabrata</i>) | A |
| Grape groundcherry | <i>Physalis viscosa</i> | B |
| Kelp | <i>Polygonum coccineum</i> | C |
| Japanese knotweed | <i>Polygonum cuspidatum</i> | B |
| Himalayan knotweed | <i>Polygonum polystachyum</i> | B |
| Giant knotweed | <i>Polygonum sachalinense</i> | B |
| Creeping mesquite | <i>Prosopis strombulifera</i> | A |
| Austrian fieldcress | <i>Rorippa austriaca</i> | B |
| Common Russian thistle | <i>Salsola australis</i> (<i>S. tragus</i>) | C |
| Spineless Russian thistle | <i>Salsola collina</i> | Q |
| Barbwire Russian thistle | <i>Salsola paulsenii</i> | C |
| Wormleaf salsola | <i>Salsola vermiculata</i> | A |
| Mediterranean sage | <i>Salvia aethiopis</i> | B |
| Meadow sage | <i>Salvia virgata</i> (<i>S. pratensis</i>) | A |

| <u>Common Name</u> | <u>Scientific Name</u> | <u>Rating</u> |
|--|---|---------------|
| Salvinia | <i>Salvinia auriculata complex</i> (<i>S. auriculata</i> , <i>S. biloba</i> , <i>S. herzogii</i> and <i>S. molesta</i>) | Q |
| Golden thistle | <i>Scolymus hispanicus</i> | A |
| Tansy ragwort | <i>Senecio jacobaea</i> | B |
| Oxford ragwort | <i>Senecio squalidus</i> | B |
| Giant foxtail | <i>Setaria faberi</i> | B |
| Heartleaf nightshade | <i>Solanum cardiophyllum</i> | A |
| Carolina horsenettle | <i>Solanum carolinense</i> | B |
| Torrey's nightshade | <i>Solanum dimidiatum</i> | A |
| White horsenettle | <i>Solanum elaeagnifolium</i> | B |
| Lanceleaf nightshade | <i>Solanum lanceolatum</i> | B |
| White-margined nightshade | <i>Solanum marginatum</i> | B |
| Perennial sow thistle | <i>Sonchus arvensis</i> | A |
| Johnson grass and other perennial Sorghum spp. (including sweet Sudan grass) | <i>Sorghum halepense</i> | C |
| Austrian peaweed | <i>Sphaerophysa salsula</i> | A |
| Witchweed | <i>Striga lutea</i> (<i>S. asiatica</i>) | A |
| Rough cornfrey | <i>Symphytum asperum</i> | B |
| Medusahead | <i>Taeniatherum caput-medusae</i> (<i>Elymus caput-medusae</i> & <i>T. asperum</i>) | C |
| Wild marigold | <i>Tagetes minuta</i> | A |
| Puncture vine | <i>Tribulus terrestris</i> | C |
| Gorse | <i>Ulex europaeus</i> | B |
| European mistletoe | <i>Viscum album</i> | B |
| Syrian beancaper | <i>Zygophyllum fabago</i> (<i>Z.f. var.</i> <i>brachycarpum</i>) | A |

Rating System

- A - Eradication, containment, rejection, or other holding action at the state-county level.
- B - Eradication, containment, control or other holding action at the discretion of the commissioner.
- C - Action to retard spread at the discretion of the commissioner.
- Q - Species rated in a Plant Industry Memorandum of January 1, 1990.

**NOTE: Expect updated listing with additional species by end of 1999.*

Office: Department of Food and Agriculture, Division of Plant Industry,
Control and Eradication Branch

Contact Person: Nate Dechoretz Phone: (916) 654-0768

Address: 1220 N Street, Room #A357, Sacramento, CA 95814

STATE NOXIOUS WEED REGULATIONS

Colorado

State Regulation for Noxious Weed Management

Colorado Noxious Weed Act

| <u>Common Name</u> | <u>Scientific Name</u> |
|---------------------|-----------------------------------|
| Velvetleaf | <i>Abutilon theophrasti</i> |
| *Jointed goatgrass | <i>Aegilops cylindrica</i> |
| Camelthorn | <i>Alhagi pseudalhagi</i> |
| Scentless chamomile | <i>Anthemis arvensis</i> |
| Mayweed chamomile | <i>Anthemis cotula</i> |
| Common burdock | <i>Arctium minus</i> |
| Wild mustard | <i>Brassica kaber</i> |
| Downy brome | <i>Bromus tectorum</i> |
| *Hoary cress | <i>Cardaria draba</i> |
| Plumeless thistle | <i>Carduus acanthoides</i> |
| *Musk thistle | <i>Carduus nutans</i> |
| Wild caraway | <i>Carum carvi</i> |
| *Diffuse knapweed | <i>Centaurea diffusa</i> |
| *Spotted knapweed | <i>Centaurea maculosa</i> |
| Black knapweed | <i>Centaurea nigra</i> |
| *Russian knapweed | <i>Centaurea repens</i> |
| Yellow starthistle | <i>Centaurea solstitialis</i> |
| Squarrose knapweed | <i>Centaurea virgata</i> |
| Rush skeletonweed | <i>Chondrilla juncea</i> |
| Blue mustard | <i>Chorispora tenella</i> |
| Oxeye daisy | <i>Chrysanthemum leucanthemum</i> |
| Chicory | <i>Cichorium itybus</i> |
| *Canada thistle | <i>Cirsium arvense</i> |
| Bull thistle | <i>Cirsium vulgare</i> |
| Chinese clematis | <i>Clematis orientalis</i> |
| Poison hemlock | <i>Conium maculatum</i> |
| *Field bindweed | <i>Convolvulus arvensis</i> |
| Houndstongue | <i>Cynoglossum officinale</i> |
| Yellow nutsedge | <i>Cyperus esculentus</i> |
| Flixweed | <i>Descurainia sophia</i> |
| Common teasel | <i>Dipsacus fullonum</i> |
| Quackgrass | <i>Elytrigia repens</i> |
| Redstem filaree | <i>Erodium cicutarium</i> |
| Cypress spurge | <i>Euphorbia cyparissias</i> |
| *Leafy spurge | <i>Euphorbia esula</i> |

| <u>Common Name</u> | <u>Scientific Name</u> |
|----------------------|------------------------------|
| Myrtle spurge | <i>Euphorbia myrsinites</i> |
| Halogeton | <i>Halogeton glomeratus</i> |
| Dame's rocket | <i>Hesperis matronalis</i> |
| Black henbane | <i>Hyoscyamus niger</i> |
| Common St. Johnswort | <i>Hypericum perforatum</i> |
| Dyer's woad | <i>Isatis tinctoria</i> |
| Kochia | <i>Kochia scoparia</i> |
| Perennial pepperweed | <i>Lepidium latifolium</i> |
| Dalmatian toadflax | <i>Linaria dalmatica</i> |
| *Yellow toadflax | <i>Linaria vulgaris</i> |
| Purple loosestrife | <i>Lythrum salicaria</i> |
| Coast tarweed | <i>Madia sativa</i> |
| Scotch thistle | <i>Onopordum acanthium</i> |
| Scotch thistle | <i>Onopordum tauricum</i> |
| Wild proso millet | <i>Panicum miliaceum</i> |
| African rue | <i>Peganum harmala</i> |
| Sulfur cinquefoil | <i>Potentilla recta</i> |
| Russian thistle | <i>Salsola collina</i> |
| Russian thistle | <i>Salsola iberica</i> |
| Mediterranean sage | <i>Salvia aethiopsis</i> |
| Bouncingbet | <i>Saponaria officinalis</i> |
| Common groundsel | <i>Senecio vulgaris</i> |
| Yellow foxtail | <i>Setaria glauca</i> |
| Green foxtail | <i>Setaria viridis</i> |
| Black nightshade | <i>Solanum nigrum</i> |
| Hairy nightshade | <i>Solanum sarrachoides</i> |
| Johnsongrass | <i>Sorghum halepense</i> |
| Saltcedar | <i>Tamarix parviflora</i> |
| Saltcedar | <i>Tamarix ramosissima</i> |
| Common tansy | <i>Tanacetum vulgare</i> |
| Puncturevine | <i>Tribulus terrestris</i> |
| Common mullein | <i>Verbascum thapsus</i> |

* "Top Ten" Noxious Weed Species - most widespread and cause the greatest economic impact in Colorado.

** List is due for revision during next year.

Office: Colorado Department of Agriculture, Plant Industry Design

Contact Person: Eric Lane, State Weed Coordinator Phone: (303)-239-4182

Address: 700 Kipling, Suite 4000, Lakewood, CO 80215-5894

STATE NOXIOUS WEED REGULATIONS

Iowa

State Regulation for Noxious Weed Management

Iowa Weed Law

| <u>Common Name</u> | <u>Scientific Name</u> |
|--|---|
| Butterprint | <i>Abutilon theophrasti</i> |
| Quack grass | <i>Agropyron repens</i> |
| Wild mustard | <i>Brassica arvensis</i> |
| Russian knapweed | <i>Centaurea repens</i> |
| Bull thistle | <i>Cirsium lanceolatum</i> |
| Canada thistle | <i>Cirsium arvense</i> |
| Poison hemlock | <i>Comium maculatum</i> |
| European morning glory, field bindweed | <i>Convolvulus arvensis</i> |
| Wild carrot | <i>Daucus carota</i> |
| Teasel | <i>Dipsacus</i> |
| Leafy spurge | <i>Eurphorbia esula</i> |
| Wild sunflower | <i>Helianthus annus L.</i> |
| Perennial pepper grass | <i>Lepidium draba</i> |
| Buckhorn | <i>Plantago lanceolata</i> |
| Buckthorn | <i>Rhamnus (excluding Rhamnus frangula)</i> |
| Thistle | <i>Cirsium & Carduus genera</i> |
| Multiflora rose | <i>Rosa multiflora</i> |
| Smooth dock | <i>Rumex altissimus</i> |
| Sheep sorrel | <i>Rumex acetosella</i> |
| Sour dock | <i>Rumex crispus</i> |
| Carolina horsenettle | <i>Solanum carolinense</i> |
| Perennial sow thistle | <i>Sonchus arvensis</i> |
| Shattercane | <i>Sorghum bicolor</i> |
| Puncture vine | <i>Tribulus terrestris</i> |
| Cocklebur | <i>Xanthium commune</i> |

Office: Iowa Department of Agriculture Land Stewardship
Laboratory Division

Contact Person: Gary Wolf, State Weed Commissioner

Phone: (515) 281-7030 or 281- 5861

Address: Henry A. Wallace Bldg., 2nd Floor, Des Moines, Iowa 50319

STATE NOXIOUS WEED REGULATIONS

Kansas

State Regulation for Noxious Weed Management

Kansas Noxious Weed Law

| <u>Common Name</u> | <u>Scientific Name</u> |
|------------------------|---|
| Quack grass | <i>Agropyron repens</i> |
| Musk (nodding) thistle | <i>Carduus nutans L.</i> |
| Russian knapweed | <i>Centaurea picris</i> |
| Canada thistle | <i>Cirsium arvense</i> |
| Field bindweed | <i>Convolvulus arvensis</i> |
| Leafy spurge | <i>Euphorbia esula</i> |
| Burrage weed | <i>Franseria tomentosa and discolor</i> |
| Pignut | <i>Hoffmannseggia densiflora</i> |
| Hoary cress | <i>Lepidium draba</i> |
| Sericea lespedeza | <i>Lespedeza cuneata</i> |
| Kudzu | <i>Pueraria lobata</i> |
| Multiflora rose | <i>Rosa multiflora</i> |
| Johnson grass | <i>Sorghum halepense</i> |

Office: Department of Agriculture, Division of Plant Health

Contact Person: Bill Scott/Mike Shuman Phone: (785) 862-2180

Address: 901 S. Kansas Avenue, 7th Floor, Topeka, KS 66612-1281

STATE NOXIOUS WEED REGULATIONS

Minnesota

State Regulation for Noxious Weed Management

Minnesota Noxious Weed Rules, effective 9/14/99

1. PROHIBITED NOXIOUS WEEDS

Subpart 1. State prohibited noxious weed list. The plants listed in this part are prohibited noxious weeds, because they are injurious to public health, the environment, public roads, crops, livestock, and other property. Prohibited noxious weeds must be controlled or eradicated as required in Minnesota statutes, section 18.78.

| <u>Common Name</u> | <u>Scientific Name</u> |
|-----------------------|--|
| Garlic mustard | <i>Alliaria petiolata</i> (Formerly <i>Alliaria officinalis</i>) |
| Hemp | <i>Cannabis sativa</i> |
| Plumeless thistle | <i>Carduus acanthoides</i> |
| Musk thistle | <i>Carduus nutans</i> |
| Canada thistle | <i>Cirsium arvense</i> |
| Bull thistle | <i>Cirsium vulgare</i> |
| Field bindweed | <i>Convolvulus arvensis</i> |
| Leafy spurge | <i>Euphorbia esula</i> |
| Purple loosestrife | <i>Lythrum salicaria</i> , <i>virgatum</i> , or any combination |
| Perennial sow thistle | <i>Sonchus arvensis</i> |
| *Poison ivy | <i>Toxicodendron radicans</i> (Formerly <i>Rhus radicans</i>) |

*Native species to Minnesota

Subpart 2. Federal noxious weed list. For the purpose of this part, the parasitic and the terrestrial plants listed in the Code of Federal Regulations, title 7, section 360.200 are also prohibited noxious weeds.

2. RESTRICTED NOXIOUS WEEDS

The plants listed in this part are restricted noxious weeds whose only reasonable means of control is to prohibit the importation, sale, and transportation of them or their propagating parts in the state except as provided by Minnesota Statutes, section 18.82.

| <u>Common Name</u> | <u>Scientific Name</u> |
|--|--|
| Buckthorn, common or European | <i>Rhamnus cathartica</i> |
| Buckthorn, glossy, including all cultivars | * <i>Rhamnus frangula</i> , (<i>columnaris</i> , <i>tallcole</i> , <i>asplenifolia</i> , and all other cultivars) |

**Rhamnus frangula* is a restricted noxious weed effective December 31, 2000

Note: Other noxious weeds on a Secondary Noxious Weed list may be added at the county level.

Office: Minnesota Department of Agriculture, Agronomy Services
Division

Contact person: Chuck Dale Phone: (651) 296-6123

Address: 90 W. Plato Blvd., St. Paul, MN 55107

STATE NOXIOUS WEED REGULATIONS

Montana

State Regulation for Noxious Weed Management

County Noxious Weed Control Act and Administrative Rules

Common Name

Scientific Name

Category 1

Whitetop or hoary cress

Cardaria draba

Canada thistle

Cirsium arvense

Diffuse knapweed

Centaurea diffusa

Russian knapweed

Centaurea repens

Spotted knapweed

Centaurea maculosa

Field bindweed

Convolvulus arvensis

Leafy spurge

Euphorbia esula

St. Johnswort

Hypericum perforatum

Dalmatian toadflax

Linaria dalmatica

Sulfur (erect) cinquefoil

Potentilla recta

Category 2

Orange hawkweed

Hieracium aurantiacum

Meadow hawkweed complex

Hieracium pratense, *H. floribundum*,
H. piloselloides

Dyer's woad

Isatis tinctoria

Purple loosestrife or lythrum

Lythrum salicaria, *L. virgatum*

Tansy ragwort

Senecio jacobea

Category 3

Yellow starthistle

Centaurea solstitialis

Rush skeletonweed

Chondrilla juncea

Common crupina

Crupina vulgaris

Category 1 - Weeds currently established and widespread requiring containment and suppression.

Category 2 - Recently introduced or rapidly spreading weeds requiring eradication where possible.

Category 3 - Weeds not yet detected in the state or found only in small, localized infestation requiring immediate eradication.

Office: Department of Agriculture, Agricultural and Biological Science Division

Contact Person: Barb or Mullen or Harold Stepper Phone: (406) 444-2944

Address: Capital Station, Helena, MT 59620

STATE NOXIOUS WEED REGULATION

Nebraska

State Regulation for Noxious Weed Management

Nebraska Noxious Weeds; Noxious Weed Control Act and Noxious Weed Regulations

Common Name

Scientific Name

Musk thistle

Carduus nutans

Plumeless thistle

Carduus acanthoides

Spotted knapweed

Centaurea masculosa

Diffuse knapweed

Centaurea diffusa

Leafy spurge

Euphorbia esula

Canada thistle

Cirsium arvense

Office: Department of Agriculture, Bureau of Plant Industry

Contact Person: Mitch Coffin Phone: (402) 471-2394

Address: P.O.Box 94756, Lincoln NE 68509

STATE NOXIOUS WEED REGULATION

Nevada

State Regulation for Noxious Weed Management

Classification of Weeds

| <u>Common Name</u> | <u>Scientific Name</u> |
|-------------------------------|-------------------------------|
| Camelthorn | <i>Alhagi camelorum</i> |
| Whitetop or hoary cress | <i>Cardaria draba</i> |
| Musk thistle | <i>Carduus nutans</i> |
| Russian knapweed | <i>Centaurea repens</i> |
| Purple star thistle | <i>Centaurea calcitrapa</i> |
| Iberian star thistle | <i>Centaurea iberica</i> |
| Diffuse knapweed | <i>Centaurea diffusa</i> |
| Yellow star thistle | <i>Centaurea solstitialis</i> |
| Water hemlock | <i>Cicuta spp.</i> |
| Canada thistle | <i>Cirsium arvense</i> |
| Poison hemlock | <i>Conium maculatum</i> |
| Medusahead rye | <i>Elymus caput-medusae</i> |
| Leafy spurge | <i>Euphorbia esula</i> |
| Licorice | <i>Glycyrrhiza lepidota</i> |
| Whitetop or hoary cress | <i>Hymenophyssa pubescens</i> |
| Klamath weed | <i>Hypericum perforatum</i> |
| Whitetop or hoary cress | <i>L. repens</i> |
| Whitetop or hoary cress | <i>L. latifolium</i> |
| Whitetop or hoary cress | <i>Lepidium draba</i> |
| Dalmatian toadflax | <i>Linaria dalmatica</i> |
| Scotch thistle | <i>Onopordum acanthium</i> |
| Austrian fieldcress | <i>Rorippa austriaca</i> |
| Mediatrranean sage | <i>Salvia aethiopis</i> |
| White horsenettle | <i>Solanum elaeagnifolium</i> |
| Carolina horsenettle | <i>Solanum carolinense</i> |
| Sow thistle | <i>Sonchus arvensis</i> |
| Johnson grass, Sorghum alnum, | <i>Sorghum spp.</i> |
| Perennial sweet Sudan grass | |
| Austrian peaweed | <i>Sphaerophyssa salsula</i> |
| Austrian peaweed | <i>Swainsona salsula</i> |
| Puncture vine | <i>Tribulis terrestris</i> |

NOTE: List scheduled for change by end of 1999.

Office: Department of Business and Industry, Division of Agriculture
Bureau of Plant Industry

Contact Person: John O'Brien Phone: (775) 688-1180

Address: 350 Capitol Hill Ave., Reno, NV 89502

STATE NOXIOUS WEED REGULATION

New Mexico

State Regulation for Noxious Weed Management

Currently (as of 9/99), New Mexico has no noxious weed law or list. A weed law and list are being developed. The following list contains the names of the plants considered 1999 Listing Options.

Class "A" Weeds:

Class "A" weeds are non-native species with a limited distribution in New Mexico. Preventing new infestations and eliminating existing infestations is the highest priority.

| <u>Common Name</u> | <u>Scientific Name</u> |
|----------------------|---|
| Camelthorn | <i>Alhagi pseudohagi</i> |
| Onionweed | <i>Asphodelus fistulosus</i> |
| Hoary cress | <i>Cardaria draba</i> |
| Purple starthistle | <i>Centaurea calcitrapa</i> |
| Diffuse knapweed | <i>Centaurea diffusa</i> |
| Spotted knapweed | <i>Centaurea maculosa</i> |
| Yellow starthistle | <i>Centaurea solstitialis</i> |
| Canada thistle | <i>Cirsium arvense</i> |
| Alfombrilla | <i>Drymaria arenarioides</i> |
| Leafy spurge | <i>Euphorbia esula</i> |
| Hydrilla | <i>Hydrilla verticillata</i> |
| Black Henbane | <i>Hyoscyomus niger</i> |
| Dyer's woad | <i>Isatis tinctoria</i> |
| Perennial pepperweed | <i>Lepidium latifolium</i> |
| Dalmation toadflax | <i>Linaria genistifolia</i> <i>ssp. dalmatia</i> |
| Yellow toadflax | <i>Linaria vulgaris</i> |
| Purple loosestrife | <i>Lythrum salicaria</i> |
| Scotch thistle | <i>Onopordum acanthium</i> |

Class "B" Weeds:

Class "B" weeds are non-native species that are presently limited to portions of the state. Class "B" species are designated for control in regions where they are not yet widespread. Preventing infestation in these areas is a high priority. In regions where a class "B" species is already abundant control is decided at the local level with containment as the primary goal.

| <u>Common Name</u> | <u>Scientific Name</u> |
|--------------------|-----------------------------|
| Russian Knapweed | <i>Acroptilon repens</i> |
| Musk thistle | <i>Carduus nutans</i> |
| Malta starthistle | <i>Centaurea melitensis</i> |
| Teasel | <i>Dipsacus fullonum</i> |

Common Name

Woollyleaf bursage
Halogeton
African rue

Scientific Name

Franseria grayi
Halogeton glomeratus
Peganum harmala

Class "C" Weeds:

Class "C" weeds are other non-native weeds found in New Mexico. Many of these species are widespread in the state. Long-term programs of suppression and management are a local option, depending upon local threats and the feasibility of management in local areas.

Common Name

Jointed goatgrass
Bull thistle
Saltcedar

Scientific Name

Aegilops cylindrica
Cirsium vulgare
Tamarix spp.

Office: Cooperative Extension Service, Plant Science Department

Contact Person: Richard Lee, Weed Specialist

Phone: (505)646-2888/646-5280

Address: P.O. Box 30003, Dept. 3AE, Las Cruces, NM 88003

STATE NOXIOUS WEED REGULATION

North Dakota

State Regulation for Noxious Weed Management

North Dakota Noxious Weed Law and Regulations

Common Name

Scientific Name

| | |
|--------------------------------|---|
| Absinthe wormwood | <i>Artemisia absinthum</i> |
| Musk thistle | <i>Carduus nutans</i> |
| Diffuse knapweed | <i>Centaurea diffusa</i> |
| Spotted knapweed | <i>Centaurea maculosa</i> |
| Yellow starthistle | <i>Centaurea solstitialis</i> |
| Russian knapweed | <i>Centaurea repens</i> |
| Canada thistle | <i>Cirsium arvense</i> |
| Field bindweed, Creeping jenny | <i>Convolvulus arvensis</i> |
| Leafy spurge | <i>Euphorbia esula</i> |
| Purple loosestrife | <i>Lythrum salicaria</i> , <i>L. virgatum</i> , and all cultivars |

Office: North Dakota Department of Agriculture, Noxious Weed Division

Contact Person: John Leppert

Phone: (701) 328-2379
jleppert@state.nd.us

Address: 600 E. Blvd., State Capital, 6th Floor, Bismarck, ND 50505-0020

STATE NOXIOUS WEED REGULATIONS

South Dakota

State Regulation for Noxious Weed Management

The Noxious Weed Law, Weed and Pest Control

Common Name

Scientific Name

Hoary cress

Cardaria draba

Russian knapweed

Centaurea repens

Canada thistle

Cirsium arvense

Field bindweed

Convolvulus arvensis

Leafy spurge

Euphorbia esula

Purple loosestrife

Lythrum spp.

Perennial sow thistle

Sonchus arvensis

Office: Department of Agriculture, Plant Industry Division of Regulatory Services

Contact Person: Darwin Kurtenbach Phone: (605) 773-3796

Address: 523 E. Capital Avenue, Pierre, SD 57501-3182

STATE NOXIOUS WEED REGULATIONS

Texas

State Regulation for Noxious Weed Management

Texas does not have state noxious weed regulations. Noxious weed seed regulations prohibit the sale of agricultural or vegetable seed containing noxious weed seed. The Federal Noxious Weed Act of 1974 provides the noxious weed regulations for Texas.

Office: Texas Department of Agriculture, Pesticide Program

Contact Person: Mark Trostle Phone: (512) 463-7422

Address: P.O. Box 12847, Austin, TX 78711.

STATE NOXIOUS WEED REGULATIONS

Utah

State Regulation for Noxious Weed Management

Utah Noxious Weed Act

| <u>Common Name</u> | <u>Scientific Name</u> |
|--|--|
| Quackgrass | <i>Agropyron repens (L.) Beauv.</i> |
| Whitetop | <i>Cardaria spp.</i> |
| Musk thistle | <i>Carduus nutans L.</i> |
| Squarrose knapweed | <i>Centaurea squarrosa Roth</i> |
| Spotted knapweed | <i>Centaurea masculosa</i> |
| Russian knapweed | <i>Centaurea repens L.</i> |
| Yellow starthistle | <i>Centaurea solstitialis L.</i> |
| Diffuse knapweed | <i>Centaurea diffusa Lam.</i> |
| Bindweed (wild morning glory) | <i>Colvolvulus spp.</i> |
| Bermudagrass* | <i>Cynodon dactylon (L) Pers.</i> |
| Leafy spurge | <i>Euphorbia esula L.</i> |
| Dyers woad | <i>Isatis tinctoria L.</i> |
| Broad-leaved pepper grass (tall whitetop) | <i>Lepidium latifolium L.</i> |
| Purple loosestrife | <i>Lythrum salicaria, L. Virgatum</i> |
| Canada thistle | <i>Cirsium arvense (L.) Scop.</i> |
| Scotch thistle (cotton thistle) | <i>Onopordium acanthium L.</i> |
| Johnson grass, Sorghum alnum | <i>Sorghum spp.</i> |
| Medusahead | <i>Taeniatherum caput- medusae (L.) Nevski</i> |

* Bermudagrass (*Cynodon dactylon*) shall not be a noxious weed in Washington County and shall not be subject to provisions of the Utah Noxious Weed Law within the boundaries of that county.

Office: Utah State Department of Agriculture, Plant Industry
Division

Contact Person: Steve Burmingham Phone: (801) 538-7183

Address: 350 N. Redwood Road, P.O. Box 146500, Salt Lake City,
UT 84116

STATE NOXIOUS WEED REGULATIONS

Wyoming

State Regulation for Noxious Weed Management

Wyoming Weed and Pest Control Act; Wyoming Weed and Pest Special Management Program

| <u>Common Name</u> | <u>Scientific Name</u> |
|---|-----------------------------------|
| Quackgrass | <i>Agropyron repens</i> |
| Common burdock | <i>Arctium minus</i> |
| Hoary cress or whitetop | <i>Cardaria pubescens</i> |
| Hoary cress or whitetop | <i>Cardaria draba</i> |
| Plumeless thistle | <i>Carduus acanthoides</i> |
| Musk thistle | <i>Carduus mutans</i> |
| Spotted knapweed | <i>Centaurea maculosa</i> |
| Russian knapweed | <i>Centaurea repens</i> |
| Diffuse knapweed | <i>Centaurea diffusa</i> |
| Ox-eye daisy | <i>Chrysanthemum leucanthemum</i> |
| Canada thistle | <i>Cirsium arvense</i> |
| Field bindweed | <i>Convolvulus arvensis</i> |
| Hounds tongue | <i>Cynoglossum officinale L.</i> |
| Leafy spurge | <i>Euphorbia esula</i> |
| Skeletonleaf bursage | <i>Franseria discolor</i> |
| Dyer's woad | <i>Isatis tinctoria L.</i> |
| Perennial pepper weed or giant whitetop | <i>Lepidium latifolium</i> |
| Dalmatian toadflax | <i>Linaria dalmatica</i> |
| Yellow toadflax | <i>Linaria vulgaris</i> |
| Purple loosestrife | <i>Lythrum salicaria L.</i> |
| Scotch thistle | <i>Onopordum acanthium</i> |
| Perennial sow thistle | <i>Sonchus arvensis</i> |
| Saltcedar | <i>Tamarix spp.</i> |

Office: Wyoming Department of Agriculture, Weed and Pest Division

Contact Person: Lucy Hansen Phone: (307) 777-7323

Address: 2219 Carey Avenue, Cheyenne, WY 82002-0100

APPENDIX C
EXAMPLE OF FEDERAL INTERAGENCY AGREEMENT
FOR NOXIOUS WEED MANAGEMENT

INTERAGENCY AGREEMENT

BETWEEN

U.S. DEPARTMENT OF AGRICULTURE
GUNNISON-UNCOMPAHGRE-GRAND MESA
AND
SAN JUAN-RIO GRANDE
NATIONAL FORESTS

AND

U.S. DEPARTMENT OF ENERGY
WESTERN AREA POWER ADMINISTRATION
COLORADO RIVER STORAGE PROJECT OFFICE

FOR

NOXIOUS WEED MANAGEMENT

INTERAGENCY AGREEMENT
BETWEEN

U.S. DEPARTMENT OF AGRICULTURE
GUNNISON-UNCOMPAHGRE-GRAND MESA
AND
SAN JUAN-RIO GRANDE
NATIONAL FORESTS

AND

U.S. DEPARTMENT OF ENERGY
WESTERN AREA POWER ADMINISTRATION
COLORADO RIVER STORAGE PROJECT OFFICE

FOR

NOXIOUS WEED MANAGEMENT

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INTERAGENCY AGREEMENT
BETWEEN

U.S. DEPARTMENT OF AGRICULTURE
GUNNISON-UNCOMPAHGRE-GRAND MESA
AND
SAN JUAN-RIO GRANDE
NATIONAL FORESTS
AND
U.S. DEPARTMENT OF ENERGY
WESTERN AREA POWER ADMINISTRATION
FOR
NOXIOUS WEED MANAGEMENT

1. PREAMBLE

THIS INTERAGENCY AGREEMENT, made this 21st day of September, 1994, pursuant to the Reclamation Act approved June 17, 1902, (32 Stat.388), the Economy Act of June 30, 1932. (31 U.S.C. 1535), the National Environmental Policy Act of 1969 (83 State. 852. U.S.C. 4321), and the Department of Energy Organization Act approved August 4, 1977 (91 Stat. 565), the Amended Federal Noxious Weed Act (7 U.S.C. 2801), and acts amendatory and supplementary to the foregoing Acts: between the UNITED STATES OF AMERICA, acting by and through the Administrator, Western Area Power Administration, an agency of the Department of Energy, hereinafter called "Western," represented by the officer executing this Interagency Agreement, or a duly Authorized Representative, hereinafter called "Contracting Officer," and U.S. FOREST SERVICE, GUNNISON-UNCOMPAHGRE-GRAND MESA and SAN JUAN-RIO GRANDE NATIONAL FORESTS, represented by the Gunnison-Uncompahgre-Grand Mesa, and San Juan-Rio Grande Forest Supervisors, hereinafter individually called "Forest," or collectively called "Forests;" Western and the Forests or their successors and assigns, each sometimes hereinafter individually called "Party," and all sometimes hereinafter collectively called the "Parties."

2. EXPLANATORY RECITALS

2.1 Western operates, manages, and maintains transmission lines and facilities across and upon Federal lands managed by the Gunnison-Uncompahgre-Grand Mesa and San Juan-Rio Grande National Forests.

Interagency Agreement No. 94-SLC-0249
SJNF No. 110213109450

- 2.2 In 1990, Colorado passed the Colorado Weed Act (Act) to bring under control four weed species that threatened the economic value of property and limit its agricultural development potential.
 - 2.3 Facility development has the potential to provide a disturbed soil environment where noxious weeds can invade.
 - 2.4 Because Western and the Forests have mutual responsibilities, as are specified in the Act, it is in their best interest and the best interest of the public to share their human and financial resources, when possible, and when in conformance with the missions of the two agencies and state and Federal laws and regulations.
 - 2.5 The Parties have therefore agreed to specify the areas of potential assistance and to implement annual weed control and management operation plans, included in the attached Exhibits when and where specific funding requirements and procedures are identified, established, and authorized.
 - 2.6 This Interagency Agreement (Agreement) is in conformance with the attached Memorandum of Understanding (MOU) dated November 25, 1983, executed between U.S. Forest Service Regions 1, 2, 3, 4, 5, and 9 and the Department of Energy, specifically Section II. C., entitled Programming.
 - 2.7 The MOU provides for the expenditure of funds by either agency to perform tasks and services defined and mutually agreed to in this Interagency Agreement, including the control and management of noxious weeds as defined by the Act.
3. AGREEMENT
- The parties agree to the terms and conditions set forth herein.

4. TERM OF AGREEMENT

- 4.1 This Agreement shall become effective in its entirety upon the date first written above, and subject to termination as otherwise herein provided for, shall remain in effect for five (5) years, and thereafter may be extended for 5 year intervals upon mutual agreement.
- 4.2 Any party may terminate this Agreement by providing 30 days written notice to the other Parties.
- 4.3 Any Party may terminate work outlined in the Exhibits upon 30 days advance written notice to the other Parties.
- 4.4 All obligations incurred by any Party shall be preserved until satisfied.

5. WORK TO BE PERFORMED

- 5.1 The Forests, at Western's expense, are responsible for:
 - 5.1.1 Identifying noxious weed populations within Western's rights-of-way by performing an optical survey of Western's transmission line and access rights-of-way.
 - 5.1.2 Specifying the noxious weed species and the acreage of each within Western's right-of-way boundaries included on the attached Exhibits, and preparing and providing a location map identifying the extent of noxious weed infestation within Western's rights-of-way for each district.
 - 5.1.3 Notifying Western of the estimated cost and the time frame for applications necessary to bring the infestation to within agreed upon management levels, as listed in the attached Exhibits.
 - 5.1.4 Executing an Operation Plan in an Exhibit before work is performed.

- 5.1.5 Managing integrated noxious weed treatment activities in the agreed upon areas and manner, as outlined in the Exhibit.
 - 5.1.6 Ensuring that their noxious weed treatment practices and procedures comply with Federal and State laws and regulations, including environmental regulations.
 - 5.1.7 Submitting a billing for payment to Western by September 1 for work performed in that fiscal year.
 - 5.1.8 Providing a year end report to Western on or about November 1 of each year that weed treatment was performed. This report should include photographs of the treated areas and actual costs and resources used for that year.
- 5.2 Western, at its own expense, is responsible for:
- 5.2.1 Reviewing and concurring with the areas within its rights-of-way that contain noxious weeds and the proposed methods and duration of time for control.
 - 5.2.2 Revising the Operation Plan, listed in the attached Exhibit, before May 1 of each year to fund the Forests' weed control costs for the current fiscal year.
 - 5.2.3 Resolving differences where the Forests' estimate of the scope and costs differs from that of Western. If availability of funds are at issue, tasks may be deferred to the following fiscal year upon notification by Western to the Forests.
 - 5.2.4 End-of-year auditing of the task and funds expended and notifying the Forests of estimated funds for the coming fiscal year until such time as Western and the Forests agree that no further direct noxious weed management efforts are required.

- 5.3 The Parties will meet before March 1 of each year, beginning in 1995, to determine availability of funding and whether the Operation Plan stated in the Exhibit will be implemented for noxious weed control and management activities proposed for the coming summer season. The meeting will be conducted at a Forest Supervisor's office or a mutually agreeable location.

6. PAYMENT

- 6.1 Claims by the Forests for services rendered and expenses incurred under this Agreement and specifically approved in the attached Exhibits, shall utilize the Simplified Intragovernmental Billing and Collection System.
- 6.2 All claims by the Forests for expenses incurred must be submitted to Western by September 1 of each year that weed treatment was performed. The Forest's invoice shall be sent to the Montrose District Office at:

Western Area Power Administration
Montrose District Office
ATTN: L1130 - Finance
1800 South Rio Grande Avenue
Montrose, CO 81401

- 6.3 Claims shall specify the appropriate District and Forest office that completed each specific Operation Plan pursuant to the appropriate Exhibit. Western's fund transfer vouchers or checks for reimbursement shall be sent to the Forest as listed in the Exhibits.

7. EXHIBITS

Inasmuch as certain provisions of this Agreement may change during the term hereof, they will be set forth in exhibits from time to time agreed upon by the Parties. The initial Exhibits, and all future Exhibits shall be attached hereto and made a part hereof, and each shall be in force and effect in accordance with its terms unless superseded by a subsequent Exhibit.

8. AUTHORIZED REPRESENTATIVES OF THE PARTIES

8.1 The following representatives are authorized to act on behalf of the Parties with respect to those matters contained herein which are the functions and responsibilities of its Authorized Representatives:

8.1.1 The Authorized Representative for all non-emergency normal work day contacts for Western is:

Area Manager
Colorado River Storage Project Office
Western Area Power Administration
P.O. Box 11606
Salt Lake City, UT 84147-0606
(801) 524-5493

8.1.2 For emergency situations, such as fire or safety hazards, or during non-normal work hours, the contact for Western shall be:

Montrose Dispatch Center
Montrose District Office
Western Area Power Administration
1-800-451-6951 (24 Hours)

8.1.3 The Authorized Representatives for the Forests are:

Forest Supervisor
Gunnison-Uncompahgre-Grand Mesa
2250 South Highway 50
Delta, CO 81416
(303) 847-7691

Forest Supervisor
San Juan-Rio Grande National Forest
701 Camino Del Rio
Durango, CO 81301
(970) 247-4261

8.1.4 The Technical Representative for all non-emergency normal work day contacts and an emergency representative handling situations such as fire or safety hazards during non-normal work hours are listed separately for each District in the attached Exhibits.

8.2 Any Party may change the designation of its Authorized Representative or its Technical Representation upon oral notice given to the other Parties, confirmed promptly by written notice.

9. GENERAL POWER CONTRACT PROVISIONS

The General Power Contract Provisions effective January 3, 1989, attached hereto, are hereby made a part of the Agreement the same as if they had been expressly set forth herein: Provided, That Articles 1-12, 15-19, 21-26, and 32 shall not be applicable hereunder.

IN WITNESS WHEREOF, the Parties hereto have caused this Interagency Agreement to be duly executed the day and year first written above.

WESTERN AREA POWER ADMINISTRATION

By: _____

Manager
Colorado River Storage Project Office
Western Area Power Administration
Salt Lake City, Utah
Page 1 of 4

U.S. FOREST SERVICE
GUNNISON-UNCOMPAHGRE-GRAND MESA
NATIONAL FOREST

By: _____

Title: _____

Address: _____

U.S. FOREST SERVICE
SAN JUAN-RIO GRAND NATIONAL FOREST

By: _____

Title: _____

Address: _____

EXHIBIT A-94

OPERATION PLAN FOR OURAY RANGER DISTRICT
GUNNISON-UNCOMPAHGRE-GRAND MESA NATIONAL FOREST
FISCAL YEAR 1994
MANAGEMENT OF NOXIOUS WEEDS

1. This Exhibit A-94 made this 21st day of September, 1994, to be effective under and as part of Interagency Agreement No. 94-SLC-0249, dated September 21, 1994, hereinafter called the "Agreement," shall become effective September 21, 1994, and shall remain in effect until superseded by another Exhibit A; Provided, That this Exhibit A or any superseding Exhibit A or any superseding Exhibit A shall be terminated by the expiration of the original Agreement.
2. The Forest or Western may terminate this Exhibit A-94 upon 30 days advance written notice to the Parties, pursuant to Section 4 of the Agreement. Western will reimburse the Forest for any commitments, pursuant to this Agreement, that extend beyond the effective date of the stated termination, which commits the Forest, in the exercise of due diligence, and which the Forest is unable to cancel.
3. All arrangements are contingent upon the availability of funds and authorization to pay for services performed. The total cost shall not exceed the Total Cost Estimate by ten (10) percent provided for in Section 5 of this Exhibit for the work to be completed in the appropriate fiscal year. Any additional expenses must be authorized by Western.

Exhibit A-94
U.S. Forest Service
Interagency Agreement No. 94-SLC-0249

4. Report of Noxious Weed Infestation (pursuant to Section 5 of the Agreement):

| Species | Estimated Acres |
|----------------|-----------------|
| Canada Thistle | 10 |
| Total | 10 |

5. Total Cost Estimates (pursuant to Section 5 of the Agreement):

| | | |
|-------------------------|--|----------|
| Supervision | @ \$20.00 per acre | \$200.00 |
| Treatment | @ \$60.00 per acre | \$600.00 |
| Possible Herbicides | Tordon 22K (Picloram) .5-1.0 lbs/acre Spike treflan 6G (tebuthiron) 2 lbs/acre | |
| Timeframe for Treatment | rapid growth period (late June and July) | |
| TOTAL COST | | \$800.00 |

6. Total projected yearly cost per acre (Pursuant to Section 5 of the agreement):

| YEAR | COST/ACRE |
|-------|-----------|
| 1994 | \$80.00 |
| TOTAL | \$80.00 |

7. The Technical Representative for all non-emergency normal work day contact for the Ouray District will be:

Mr. Jim Free
District Ranger
Ouray Ranger District
Gunnison-Uncompahgre-Grand
Mesa National Park
2505 South Townsend
Montrose, CO 81401
(970) 249-3711

8. The contact person for emergency situations, such as fire or safety hazards, or during non-normal work hours for the Ouray District shall be:

Fire Dispatch
Ouray Ranger District
Gunnison-Uhcompahgre-
Grand Mesa National Forest
2505 South Townsend
Montrose, CO 81401
(970) 240-1010

9. The Technical Representative for Western is:

Mr. Gene Iley
Colorado River Storage Project Office
P.O. 11606
Salt Lake City, UT 84147-0606

10. Western's fund transfer vouchers or checks for reimbursement shall be sent to the Forest at:

Gunnison-Uncompahgre-Grand Mesa National Forest
Ouray Ranger District
ATTN: Budget and Finance
2250 Highway 50
Delta, CO 81416

IN WITNESS WHEREOF. the Parties have caused this Exhibit A-94 to be duly executed the day and year first written above.

WESTERN AREA POWER ADMINISTRATION

By: _____

Manager
Colorado River Storage Project
Office
Western Area Power
Administration
Salt Lake City, Utah

U.S. FOREST SERVICE
GUNNISON-UNCOMPAHGRE-GRAND MESA
NATIONAL FOREST

By: _____

Title: _____

Address: _____

EXHIBIT B-94/95

OPERATION PLAN FOR DOLORES-MANCOS DISTRICT
SAN JUAN-RIO GRANDE NATIONAL FOREST
FISCAL YEAR 1994 AND 1995
MANAGEMENT OF NOXIOUS WEEDS

1. This Exhibit B-94/95 is made this 21st day of September, 1994, to be effective under and as part of Interagency Agreement No. 94-SLC-0249, dated September 21, 1994, hereinafter called the "Agreement," shall become effective September 21, 1994, and shall remain in effect until superseded by another Exhibit B: Provided, That this Exhibit B or any superseding Exhibit B shall be terminated by the expiration of the original Agreement.
2. The Forest or Western may terminate this Exhibit B-94/95 upon 30 days advance written notice to the Parties, pursuant to Section 4 of the Agreement. Western will reimburse the Forest for any commitments, pursuant to this Agreement. that extend beyond the effective date of the stated termination, which commits the Forest, in the exercise due diligence, and which the Forest is unable to cancel.
3. All arrangements are contingent upon the availability of funds and authorization to pay for services performed. The total cost shall not exceed the Total Cost Estimate by ten (10) percent provided for in Section 5 of this Exhibit for the work to be completed in the appropriate fiscal year. Any additional expenses must be authorized by Western.

4. Report of Noxious Weed Infestation (pursuant to Section 5 of the Agreement):

| Species | No. of Acres |
|------------------|--------------|
| Canada Thistle | 60 |
| Musk Thistle | 100 |
| Russian Knapweed | 2 |
| Spotted Knapweed | 5 |
| White Top | 1 |
| Total | 168 |

5. Total Cost Estimates and Timeframes (pursuant to Section 5 of the Agreement):

FISCAL YEAR 1994

| ITEM | SOURCE | SPECIFIC | \$/DAY | SUBTOTALS |
|---------------------------------|--------|--------------|----------|------------|
| Monitoring/ Inventory | | 10 days/GS-7 | \$148.00 | \$1,480.00 |
| TOTAL COST ESTIMATE FOR FY 1994 | | | | \$1,480.00 |

FISCAL YEAR 1995

| ITEM | SOURCE | SPECIFIC | \$/DAY | SUBTOTALS |
|---------------------------------|----------|------------------|----------|--------------|
| Labor | Contract | | | |
| Equipment | Contract | Ground Rigs | | |
| Vehicles | Contract | | | |
| Herbicide | Contract | Tordon 22K/2,4-D | | \$11,000.00 |
| Supervision /Adm | | 5 days/GS-11 | \$198.00 | \$990.00 |
| | | 15 days/GS-7 | \$148.00 | \$2,220.00 |
| Monitoring/ Inventory | | 10 days/GS-7 | \$148.00 | \$1,480.00 |
| TOTAL COST ESTIMATE FOR FY 1995 | | | | \$15,690.000 |

6. Total projected yearly cost per acre (pursuant to Section 5 of the agreement):

| YEAR | COST/ACRE |
|------|-----------|
| 1994 | \$93.00 |
| 1995 | \$93.00 |
| 1996 | \$90.00 |
| 1997 | \$90.00 |
| 1998 | \$85.00 |

7. The Technical Representative for all non-emergency normal work day contact for the Dolores-Mancos District will be:

Ms. Kathy Peckham
Mancos Ranger District
41595 East Highway 160
Box 330
Mancos, CO 81328
(970) 533-7716

8. The contact person for emergency situations, such as fire or safety hazards, or during non-normal work hours for the Dolores-Mancos District shall be:

Mr. Mark Tucker
Ms. Kathy Peckham
Dolores Ranger District
100 North Sixth
Box 210
Dolores, CO 81323
(970) 882-7296

9. The Technical Representative for Western is:

Mr. Gene Iley
Colorado River Storage Project Office
P.O. Box 11606
Salt Lake City, UT 84147-0606

10. Western fund transfer vouchers or checks for reimbursement shall be sent to the Forest at:

San Juan-Rio Grande National Forest
ATTN: Budget and Accounting
Dolores-Mancos District
701 Camino Del Rio
Durango, CO 81301

IN WITNESS WHEREOF, the Parties hereto have caused this Exhibit B-94/95 to be duly executed the day and year first written above.

WESTERN AREA POWER ADMINISTRATION

By: _____

Manager
Colorado River Storage Project
Office
Western Area Power Administration
Salt Lake City, Utah

U.S. FOREST SERVICE
SAN JUAN-RIO GRANDE
NATIONAL FOREST

By:_____

Title:_____

Address:_____

EXHIBIT C-94

OPERATION PLAN FOR THE NORWOOD DISTRICT
GUNNISON-UNCOMPAHGRE-GRAND MESA NATIONAL FOREST
FISCAL YEAR 1994
MANAGEMENT OF NOXIOUS WEEDS

1. This Exhibit C-94 is made this 21st day of September, 1994, to be effective under and as part of Interagency Agreement No. 94-SLC-0249, dated September 21, 1994, hereinafter called the "Agreement," shall become effective September 21, 1994, and shall remain in effect until superseded by another Exhibit C; Provided, that this Exhibit C or any superseding Exhibit C shall be terminated by the expiration of the original Agreement.
2. The Forests or Western may terminate this Exhibit C-94 upon 30 days advance written notice to the Parties, pursuant to Section 4 of the Agreement. Western will reimburse the Forest for any commitments, pursuant to this Agreement, that extend beyond the effective date of the stated termination, which commits the Forests, in the exercise of due diligence, and which the Forest is unable to cancel.
3. All arrangements are contingent upon the availability of funds and authorization to pay for service performed. The total cost shall not exceed the Total Cost Estimate by ten (10) percent provided for in Section 5 of this Exhibit for the work to be completed in the appropriate fiscal year. Any additional expenses must be authorized by Western.
4. Total Cost Estimates and Timeframes (pursuant to Section 5 of the Agreement):

FISCAL YEAR 1994

| ITEM | SOURCE | SPECIFIC | \$/DAY | SUBTOTALS |
|--------------------------|--------|--------------|----------|-----------|
| Monitoring/ Inventory | | 3 days/GS-11 | \$163.63 | \$490.89 |
| TOTAL COST FOR FY 1994 | | | | \$490.89 |

5. The Technical Representative for all non-emergency normal work day contact for the Norwood District will be:

Ms. Kelly Liston
Norwood District
Gunnison-Uncompahgre-Grand Mesa National Forest
P.O. Box 388
Norwood, CO 81423
(970) 327-4261

6. The contact person for emergency situation, such as fire or safety hazards, or during non-normal work hours for the Norwood District will be:

Fire Dispatch
Norwood District
(970) 327-4291

7. The Technical Representative for Western is:

Mr. Gene Iley
Colorado River Storage Project Office
P.O. Box 11606
Salt Lake City, UT 84147-0606

8. Western's fund transfer vouchers or checks for reimbursement shall be sent to the Forest at:

Gunnison-Uncompahgre-Grand Mesa National Forest
ATTN: Budget and Finance
Norwood District
P.O. Box 388
Norwood, CO 81423

IN WITNESS WHEREOF, the Parties hereto have caused this Exhibit C-94 to be duly executed the day and year first written above.

WESTERN AREA POWER ADMINISTRATION

By:_____

Manager
Colorado River Storage Project Office
Western Area Power Administration
Salt-Lake City, Utah

U.S. FOREST SERVICE
GUNNISON-UNCOMPAGRE-GRAND MESA
NATIONAL FOREST

By:_____

Title:_____

Address:_____

MEMORANDUM OF UNDERSTANDING
BETWEEN
FOREST SERVICE, U.S. DEPARTMENT OF AGRICULTURE
AND
WESTERN AREA POWER ADMINISTRATION
U.S. DEPARTMENT OF ENERGY

PURSUANT TO the Memorandum of Understanding between The Department of Energy and The Department of Agriculture, dated October 30, 1978, and the Federal Land Policy and Management Act of October 21, 1976 (P.L. 94-579); 36 C.F.R. 251.50 et. seq. (Regulations for National Forest System lands; Special Uses), this Agreement sets forth requirements and procedures applicable when the Western Area Power Administration (hereinafter called Western) plans, applies for, occupies, and uses National Forest System lands for the planning, construction, operation, and maintenance of facilities associated with the transmission of electricity. The States involved are: Arizona, New Mexico, California, Montana, Utah, Nevada, Colorado, Nebraska, Kansas, North Dakota, South Dakota, Minnesota, western Texas, Wyoming, and southeastern Idaho. The Forest Service Regions that are involved are: Northern (R-1), Rocky Mountain (R-2), Southwestern (R-3), Intermountain (R-4), Pacific Southwest (R-5), Eastern (R-9).

WHEREAS, the Forest Service manages National Forest System lands, and

WHEREAS, Western assumed the power marketing responsibilities of the Bureau of Reclamation (BuRec) pursuant to Section 302 of the Department of Energy Organization Act (42 U.S.C. 7152) and

WHEREAS, Western obtains land use authorizations for constructing, operating, and maintaining certain facilities on National Forest System land pertaining to the transmission of electrical power, and

WHEREAS, Western and the Forest Service recognize that coordinated planning for these electrical facilities and management of these lands are desirable, necessary, and in the public interest,

NOW THEREFORE, the Forest Service, through the respective Regional Foresters, and Western, through the Assistant Administrators for Engineering and for Power Management and Operation and Maintenance, agree as follows:

Section I - GENERAL PROVISIONS

A. After requirements of the National Environmental Policy Act (NEPA) and Council on Environmental Quality (CEQ) regulations have been met, the Forest Service and Western will cooperatively plan and locate facilities on National Forest System lands. Western will design, construct, and maintain facilities to meet Western's responsibilities under Federal law for electrical transmission consistent with the Forest Service objectives, laws and regulations applicable to the management of National Forest System lands. Subject to decisions arrived at by cooperative planning and the NEPA process, the Forest Service will authorize occupancy and use of National Forest System lands to Western.

B. Western will involve the Forest Service on a continuing basis in the various planning and analysis processes concerning new facilities as soon as it is anticipated that use of National Forest System lands should be considered as a possible location alternative. The Forest Service will engage in long-range planning with Western to assure that all necessary action, i.e., land management planning, forest management plans, and actions required under the National Forest Management Act (NFMA) and NEPA, are completed and evaluated in a coordinated, timely basis.

C. The Forest Service recognizes that Western now has administrative control of rights-of-way and electrical transmission facilities on National Forest System lands that were formerly controlled and administrated by BuRec including, but not limited to, lands within the National Forest System withdrawn by BuRec for water and power projects. These transferred facilities were listed in the OMB Determination Order dated September 30, 1997.

D. It is mutually agreed to recognize and to make every effort to meet each agency's schedules, priorities, and activities for the lands and facilities covered under this Agreement.

E. Western recognizes that trees cleared from transmission line rights-of-way and access roads by its contractors may have value. The Service will be reimbursed by Western's contractors for all trees cut, injured, or destroyed in the construction of the transmission line, access roads, or other facilities at current stumpage rates applicable to the sale.

F. All activities within these phases will comply with the direction and requirements of NEPA (including CEQ regulations), NFMA, Federal Land Policy Management Act, and other applicable authority, under the authority of the Regional Forester(s) and Area Manager(s).

G. Each Regional Forester will represent the Forest Service and each Area Manager will represent Western in all matters pertaining to this Memorandum of Understanding within his Region or Area. Problems which cannot be resolved by the Regional Forester and Area Manager will be submitted to the next level of authority in the respective agencies.

Section II - PLANNING, ENVIRONMENTAL CONSIDERATION, AND PROGRAMMING

A. Planning

Western and Forest Service recognize the importance of joint planning and agree to coordinate their respective planning efforts as follows:

Western and Forest Service will meet annually, or as otherwise agreed, to exchange long range plans and near term specific projects of mutual interest. Until Forest land management plans are completed and implemented, examples of such plans include transportation, timber management, forest management, and planning for major transmission system corridors, and communications facilities.

Travel and utility corridor planning is part of the Forest land management planning process. Land allocation decisions and standards and guidelines for use and occupancy of National Forest System lands will be specified in Forest land management plans. Future proposals for use and occupancy of National Forest System lands must be compatible with the management area direction set forth in completed Forest land management plans.

Western will notify each Region of individual proposed new facilities and programs affecting National Forest System lands as soon as they become known. Each will directly and individually solicit the other's participation in development of plans which might affect the other. Western will coordinate its reconnaissance efforts on facilities and programs affecting National Forest System lands. Western will involve the Forest Service in Western's transmission line planning process in advance of any publication in the Federal Register.

To enable completion of planning and reconnaissance efforts, it may be necessary for Western to conduct field surveys for proposed road and facility rights-of-way to obtain data related to the development of project specifications and the project plan. Before surveys are conducted, temporary land use authorization to survey must be obtained in advance from the District Ranger(s) involved.

B. Environmental Coordination

As Federal agencies, Western and the Forest Service are subject to the National Environmental Policy Act of 1969. This Act sets forth a general environmental policy and several specific requirements for Federal agencies. In recognition of these provisions, the agency initiating the proposal will, unless otherwise mutually agreed, take the lead in preparing the necessary environmental documents for the proposed action. The other agency will cooperate in developing and preparing such documents.

C. Programming

Western and each separate Forest Service Region(s) will enter into a separate interagency agreement(s) providing for funding of their respective activities under this MOU.

Each agency will include the costs of their respective coordination efforts under this agreement within their normal programming procedures, as schedules permit.

When it is jointly decided that a Forest Service Project Liaison Officer or other Forest Service assistance is needed to allow a Western project to proceed expeditiously and there is sufficient lead time (3 years or more) to satisfy Forest Service budgetary requirements, the Forest Service will be responsible for financing the Forest Service Project Liaison Officer or other Forest Service participation.

When a Forest Service Region(s) does not have sufficient lead time or is unsuccessful in obtaining necessary funding for Forest Service participation, Western and each Forest Service Region will mutually determine and document the extent to which Forest Service participation benefits Western. To the extent appropriations are available, Western will then finance the Forest Service's participation. Such financing will be provided for in the construction, operation, and maintenance plan referred to in Section VI.

SECTION III - TRANSMISSION AND COMMUNICATION FACILITIES

A. Electrical Transmission Facilities

The elements of construction, operation, and maintenance of transmission facilities are covered under specific construction, operation, and maintenance plans described later. Although Western routinely inspects and maintains its transmission facilities, the Forest Service will report any observed or potential facility damage to Western.

The Forest Service's proposed activities or permitted uses adjacent to the lines will be coordinated with Western to assure that such activities and uses are compatible with National Forest management and appropriately consider the integrity of Western's operations and the safety of the facility and National Forest users.

B. Communication Facilities

The Forest Service will evaluate Western's requests for communication sites on National Forest System lands. Western concurs with the concept of shared uses insofar as technically possible and consistent with operational and security restraints. Western will perform exploratory surveys and a need analysis during planning phases.

SECTION IV - ACCESS ROADS

Road access may be needed for construction, operation, and maintenance of Western's transmission and communication systems. Forest Service management of National Forest lands includes development and management of a roads system to serve various land uses. Joint planning of road locations and development of road location and management criteria will be entered into by Western and the Forest Service during Western's facility planning.

A. Permanent roads built to serve any Western facilities may become a part of each National Forest transportation system plan when needed for National Forest System land management. When permanent roads are not needed for National Forest purposes, Western will retain such roads as part of their responsibility for maintenance.

Transportation and appurtenant facilities will be located designed, and constructed to be compatible with the Forest Service land management objectives and plans.

B. The project construction, operation, and maintenance plan, which will be a part of the land use authorization by reference, will identify road construction, use and maintenance considerations, requirements, and responsibilities including, but not limited to: environmental protection and mitigation, standards, traffic control, and public use.

C. The Forest Service has, in designated areas, joined in cooperative agreements for planning, constructing, reconstructing, improving, maintaining, and using an adequate coordinated road system.

In those agreement areas where Western operations may be involved, unless otherwise mutually agreed, it is agreed:

1. The Forest Service represents the U.S. Government in all road negotiations within an agreement area. Western may participate cost-sharing agreement areas as a third party when mutually agreeable to planning, constructing, reconstructing, improving, and maintaining the specified Forest

Service development access roads necessary in the construction or operation of Western's transmission lines.

2. Cost of road construction, improvement, or maintenance on cost-share roads will be shared by Western on the proportion that its use bears to the total use on the system road or segment(s) thereof as set forth in the land use authorization.

3. The operation and maintenance on noncost-share roads shall be Western's responsibility under a land use authorization unless otherwise agreed to be Western and the Forest Service.

4. Western can participate in joint financing in cost-share-agreement areas by performance or by deposit of funds to the Forest Service.

5. Road closures by the Forest Service will not deny access by official Western traffic for emergency or direct management purposes.

SECTION V - FOREST SERVICE LAND USE AUTHORIZATIONS

After the Forest Service issues a land use authorization for a right-of-way across National Forest System lands, Western will provide the Forest Service with a detailed construction, operation, and maintenance (COM) plan before any construction starts on segments or the total project, as mutually agreed. The project COM plan, when approved, will be incorporated by reference in the land use authorization. A land use authorization granted to Western will be limited, suspended, revoked, or terminated only with Western's concurrence.

SECTION VI - PROJECT PLANS

The project COM plan will cover all project construction, operation, and maintenance details involving the protection, management, and use of National Forest System lands. Prior to the development of a COM plan, the Forest Service and Western will determine the type, scope, and magnitude of a plan required for the specific project.

Once a land use authorization has been granted to Western by the Forest Service, no reconstruction or relocation of facilities within the project area may be authorized until a land use authorization is amended and approved. If an additional project is proposed within an existing project area, a separate land use authorization will be required for the new project.

Western and the Forest Service will cooperate to achieve a continuing management program for transmission line and road rights-of-way which integrates Western's electrical transmission objectives and National Forest resource management objectives.

The Forest Service has the land management responsibility for rights-of-way on National Forest System lands. Western will carry out its program in a manner which will protect or enhance basic Forest resource values. Where additional output of National Forest resources can be obtained through special management of the rights-of-way and without interference with Western's operational needs and without cost to Western, the Forest Service will have responsibility for that special management.

Attached is an example of an outline for a Project Construction, Operation, and Maintenance Plan which may be varied to suit the particular project.

This agreement becomes effective on the last date signed below.

Regional Forester, Region 1

Assistant Administrator for Engineering
Western Area Power Administration

Date

Date

Regional Forester, Region 2

Assistant Administrator for Power Manager
and Operation and Maintenance
Western Area Power Administration

Date

Date

Regional Forester, Region 3

Date

By: _____
Office of General Counsel

Regional Forester, Region 4

Date

(Note: Contact CSO - Art Roybal for
copy with original signatures if needed)

Regional Forester, Region 5

Date

Regional Forester, Region 9

Date

ATTACHMENT

1. Responsibilities and Coordination

a. Designated Forest Service Liaison Officer.

b. Designated Western Project Coordinator.

c. Formal, periodic coordination meetings.

d. Forest Service identification of the specific, authorized responsibility, authority, and accountability at the Forest level concerning the Forest Service Liaison Officer, District Ranger(s), and Forest Supervisor(s).

e. Western's identification of the specific, authorized responsibility, and accountability concerning Western's Project Coordinator and others at the local level.

f. The working interrelationships between the various people identified in d. and e. above, and organizational flow for resolving impasses between agency personnel follows:

| <u>Level</u> | <u>Forest Service</u> | <u>Western</u> |
|--------------|-----------------------|------------------------|
| 1st | Liaison Office | Project Coordinator |
| 2nd | Forest Supervisor | Assistant Area Manager |
| 3rd | Regional Forester | Area Manager |

2. Financing

a. Mutual financing of roads.

b. Western's financing of Forest Service Liaison Officer.

- c. Cost reimbursement authorization and financing of work performed by one agency for the other.

- d. Timber settlement agreement.

3. Environment

- a. Reference appropriate NEPA document.

- b. Highlights of the mitigation requirements in the project Environmental Assessments and Environmental Impact Statements.

- c. Detailed environmental protection, mitigation, enhancement, and restoration measures required and to be incorporated into designs and specifications covering the various project jobs and phases (see item below).

- d. Cultural resources

- e. Threatened and endangered species studies and mitigation

- f. Water quality

- g. Air quality

4. Right-of-Way Management

- a. Forest Service land management responsibilities.

- b. Western's operation and maintenance responsibilities.

- c. Planned management and protective practices.

- d. Priorities and responsibilities for emergencies.

5. Work Areas and Camps

- a. Authorization

- b. Standards

6. _____
 - a. Prevention
 - b. Presuppression
 - c. Suppression
7. Designs and Specifications
 - a. Specifications for landscaping of ROW and construction of facilities.
 - b. All necessary construction specifications and standards relating to the management, protection, enhancement, and restoration of the National Forest values.
8. Communication
9. Flagging
10. Blasting
11. Health and Safety
12. Scheduling
 - a. Inspections: potential problems, existing problems, authorization, and acceptance of work performed, and contract compliance.
 - b. Authorized time periods concerning such points as clearing, slash burning, road construction and use of overland vehicles, with constraints identified pertaining to weather conditions, etc.
13. Approval

The Forest Supervisor will approve Project Construction, Operation, and Maintenance Plans for the Forest Service. The Area manager will approve these plans for Western.

APPENDIX D
EXAMPLE WESTERN/COUNTY WEED
MANAGEMENT COOPERATIVE AGREEMENT

CONTRACT

BETWEEN

MONTROSE COUNTY, COLORADO

AND

U.S. DEPARTMENT OF ENERGY
WESTERN AREA POWER ADMINISTRATION
COLORADO RIVER STORAGE PROJECT OFFICE

FOR

NOXIOUS WEED MANAGEMENT

CONTRACT
BETWEEN
MONTROSE COUNTY, COLORADO
AND
U.S. DEPARTMENT OF ENERGY
WESTERN AREA POWER ADMINISTRATION
COLORADO RIVER STORAGE PROJECT OFFICE

FOR

NOXIOUS WEED MANAGEMENT

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CONTRACT
BETWEEN

MONTROSE COUNTY, COLORADO

AND

U.S. DEPARTMENT OF ENERGY
WESTERN AREA POWER ADMINISTRATION

FOR

NOXIOUS WEED MANAGEMENT

1. PREAMBLE

THIS CONTRACT, made this 2nd day of September, 1994, pursuant to the Reclamation Act approved June 17, 1902 (32 Stat. 388), the Economy Act of June 30, 1932, (31 U.S.C. 1535), the National Environmental Policy Act of 1969 (83 Stat. 852, 42 U.S.C. 4321), and the Department of Energy Organization Act approved August 4, 1977 (91 Stat. 565), and acts amendatory and supplementary to the foregoing Acts; between the UNITED STATES OF AMERICA, acting by and through the Administrator, Western Area Power Administration, an agency of the Department of Energy, hereinafter called "Western," represented by the officer executing this contract, or a duly Authorized Representative, hereinafter called the "Contracting Officer," and MONTROSE COUNTY, COLORADO, represented by the Board of County Commissioners, hereinafter called the "Contractor" or "County;" their successors and assigns, each sometimes hereinafter individually called "Party," and both sometimes hereinafter collectively called the "Parties."

2. EXPLANATORY RECITALS

2.1 Western operates, manages, and maintains transmission lines and facilities within Montrose County's area of jurisdiction.

- 2.2 In 1990, the Governor of Colorado approved the Colorado Weed Management Act (Act) to bring under control four weed species that threaten the economic value of property and limit its agricultural development potential.
 - 2.3 Development of facilities such as transmission lines and substations have the potential to provide a disturbed soil environment where noxious weeds can invade.
 - 2.4 Western recognizes and acknowledges the Montrose County Weed Management Plan, hereinafter called "Plan," as approved by the County Commissioners on December 31, 1991.
 - 2.5 In cooperation with the County and in accordance with the Federal Noxious Weed Act of 1974, 7 U.S.C. 2814, Western agrees to provide assistance toward obtaining control of the "noxious" weed species, as presented in the Plan, on those lands under the jurisdiction or control of the County that fall within transmission line and access road easements held by Western at the time the Exhibit is signed.
3. AGREEMENT
- The parties agree to the terms and conditions set forth herein.
4. TERM OF CONTRACT
- 4.1 This contract shall become effective in its entirety upon the date first written above, and subject to termination as otherwise herein provided for, shall remain in effect for five (5) years from the date approved herein and may be modified or extended for five (5) year intervals upon mutual agreement of Western and the County.

- 4.2 This Contract may be terminated upon 30 days advance written notice by either Party to the other, or at any time upon the mutual agreement of both Parties.
- 4.3 Upon termination of this Contract or Exhibits, Western will reimburse the County for any commitments entered into pursuant to this Contract that the County has made with others that extend beyond the effective date of the stated termination which commits the County, in the exercise of due diligence, and which the County is unable to cancel.

5. MANAGEMENT AND CONTROL OF WEEDS

5.1 State and private lands with Western easements

5.1.1 The County will be responsible for:

- (i) Assisting the identification and inventory of "noxious" weeds within Western's transmission line and access road easements across State and private lands at Western's expense.
- (ii) Assisting in the treatment of "noxious" weed populations within Western's transmission line and access road easements across State and private lands at Western's expense.
- (iii) Providing weed control results following each growing season to Western's technical representative, as agreed by both parties in the attached Exhibit A, and at Western's expense.
- (iv) Ensuring that the use of any chemicals to control "noxious" weeds comply with all requirements set forth by the Colorado Department of Agriculture and/or the U.S.

Environmental Protection Agency regarding herbicide applications and procedures.

- (v) Providing Western's point of contact with cost estimates and actuals in a timely manner where funding or reimbursement has been approved.

5.1.2 Western at its expense will be responsible for:

- (i) Assisting in the identification of "noxious" weeds within Western's transmission line and access road easements on stated and private lands.
- (ii) Providing funds, when determine available by Western, to the County to reimburse costs associated with inventory and treatment efforts that are directly associated with Western's transmission line and access road easements across state and private lands.

5.2 Federal Lands with Easements

Western is responsible for the development of weed management agreements with other Federal agencies within the County boundaries where Western's electric transmission facilities either cross or occupy Federal land and where "noxious" weed populations occur within those permitted areas. Western will advise the County of its ongoing efforts with other Federal agencies and will support the integration of such efforts when in the best interest of the Federal agencies to do so.

5.3 Western's responsibilities on its Fee-owned Land

5.3.1 Western, or its assigned agent, will be responsible for:

- (i) Conducting "noxious" weed inventories, consistent with the species designated in the County's Plan.
- (ii) Providing treatment measures to control such weed species.

- (iii) Providing the County technical point of contact with inventory and treatment summary information of those lands held in fee by Western.

5.3.2 These fee lands generally include substations and buffer zones, access roads, and electric transmission line approaches. Western will strive to manage and control "noxious" weed species using integrated management techniques that may include one or any combination of the following:

- (i) Mechanical Method (cutting and burning),
- (ii) Chemical Method (spraying with an approved herbicide),
and
- (iii) Biological Method (release of natural insect predators).

The application of one or more of these methods would be based upon the location of the weed population and adjacent ecological values.

6. LIABILITY

The County agrees to indemnify and hold harmless the United States, its employees, or its agents, from any loss or damage and from any liability on account of personal injury, death, or property damage of any nature whatsoever and by whomever made arising out of the County's, its agents', contractors', or subcontractors' actions taken under the terms of this Contract or its attached Exhibits. The United States is liable only for the negligence on the part of its officers and employees in accordance with the Federal Tort Claims Act, as amended.

7. EXHIBITS

- 7.1 Inasmuch as certain provisions of this Contract may change during the term hereof, they will be set forth in exhibits from time to time agreed upon by the Authorized Representatives of the Parties. The initial Exhibits, and all future Exhibits shall be attached hereto and made a part hereof, and each shall be in force and effect in accordance with its terms unless superseded by a subsequent Exhibit.
- 7.2 Before May 1 of each year, the County and Western technical representatives will meet to identify the areas where work will be performed by that year. Work may include identifying the entity that will perform the work, treatments to be used, cost estimates to be incurred, if applicable, and methods to be used for reporting the results of the treatment. The work will be outlined in a revised Exhibit.
- 7.3 The Technical Representatives of the Parties for all non-emergency normal work day conditions and for emergency situations, such as fire or safety hazards, or during non-normal work hours is listed in the Exhibit A.

8. BILLING AND PAYMENT

- 8.1 The County shall submit a bill to Western, at the address specified herein, prior to September 1 of each year, for tasks completed as provided in an Exhibit for that year.
- 8.2 Bills should be directed to:

Western Area Power Administration
Montrose District Office
Attn: M1130 - Finance
1800 South Rio Grande
Montrose, CO 81401

- 8.3 Payment to the County will be by check to the County's technical representative as specified in the Exhibit.

9. AUTHORIZED REPRESENTATIVES

- 9.1 As provided for in the General Power Contract Provisions, the following representatives are authorized to act on behalf of the Parties with respect to those matters contained herein which are the functions and responsibilities of its Authorized Representative:

9.1.1 The Authorized Representative for Western is:

Manager
Colorado River Storage Project Office
Western Area Power Administration
P.O. Box 11606
Salt Lake City, UT 84147-0606
(801) 524-5493

9.1.2 The Authorized Representative for the County is:

Chairman, Board of Commission
Montrose County
320 South 1st
Montrose, CO 81401
(907) 249-7755

- 9.2 The Parties may change the designation of its Authorized Representative upon oral notice given to the other Parties, confirmed promptly by written notice.

10. GENERAL POWER CONTRACT PROVISIONS

The General Power Contract Provisions effective January 3, 1989, attached hereto, are hereby made a part of the Contract the same as if they had been expressly set forth herein; Provided, That Articles 1-12, 15-19, 21-26, and 32 shall not be applicable hereunder.

IN WITNESS WHEREOF, the Parties hereto caused this Contract to be duly executed the day and year first written above.

WESTERN AREA POWER ADMINISTRATION

By: _____
Manager
Colorado River Storage Project Office
Western Area Power Administration
Salt Lake City, Utah

(COUNTY SEAL)

COUNTY OF MONTROSE, COLORADO

ATTEST:

By: _____

Title: _____

Title: _____

Address: _____

EXHIBIT A-94
OPERATION PLAN
MONTROSE COUNTY, COLORADO
FISCAL YEAR 1994
MANAGEMENT OF NOXIOUS WEEDS

1. As provided in Section 5 of Contract No. 94-SLC-0252, dated September 2, 1994, Montrose County (County) and Western Area Power Administration (Western) herein agree to the following, given the ability of funds and authorization by Western to reimburse for services to be performed in Fiscal Year 1994, as specified below:

2. TASK DESCRIPTION

- 2.1 The County shall:

- 2.1.1 Assist in the identification and location of noxious weed infestations within Western's transmission lines and access road easements located on State and private lands that cross rights-of-way administered by the County. This will be based upon the actual work performed in the previous year.

- 2.1.2 Submit an end of the year report to Western's technical representative. It should describe the work or task completed by the County that contributed to the control of weeds on Western's easements. It should also include a map depicting these treated areas and an estimate of the loaded per acre cost to accomplish this treatment. "Loaded" pertains to the weed mapping, chemical treatment, administrative, and follow-up program costs.

- 2.2 Western shall review the County's findings and proposal and prepare a response as to the acceptance or modification need to the proposal to be acceptable and set aside available funds to reimburse the County for authorized costs and expenses.

3. COST ESTIMATES

- 3.1 The cost estimate for FY 1994 is \$1,120 but actual costs shall not to exceed \$1,820. Any additional expenses must be authorized by Western. Billing will be accomplished as provided in Section 6 of the Contract.

- 3.2 The following is a cost breakdown for FY 1994:

| Cost Breakdown per Acre | |
|--|--------------------|
| \$50/acre for spraying \$10.00/acre for Administration \$10.00/acre for weed mapping, supervision inspections, follow-up work and final mapping | \$70.00 x 16 acres |
| SUBTOTAL = \$70.00/acre | \$1120.00 |
| Additional funds are set aside for expanded treatment of noxious weeds that spread away from County roads, but are within Western's right-of-way. | \$70.00 x 10 acres |
| SUBTOTAL = \$70.00/acre | \$700.00 |
| Estimated total for FY 1994 | \$1820.00 |

- 3.3 Where the County estimate of the scope and cost differs from that of Western it shall be Western's responsibility to resolve differences and, when necessary, defer tasks to the following year if the availability of funds is an issue. Western is responsible for the end-of-year audit of the task and funds expended and for conducting reviews of reports and findings for inventory and treatment tasks.

4. TECHNICAL REPRESENTATIVE

4.1 Western:

Mr. Gene Iley
Colorado River Storage Project Office
Western Area Power Administration
P.O. Box 11605
Salt Lake City, UT 84147
(801) 524-5656

4.2 County:

Mr. Dave Seymour,
Chairman
Eastern Montrose County
Weed Management Commission
1106 58.50 Road
Montrose, CO 81401
(970) 249-7262

5. TERM AND TERMINATION

This Exhibit shall remain in effect beginning October 1, 1993, through September 30, 1994, and is subject to the availability of funds. It may be terminated earlier as provided in the Contract.

IN WITNESS WHEREOF, the Parties hereto caused this Exhibit A to be duly executed the day and year first written above.

WESTERN AREA POWER ADMINISTRATION
COLORADO RIVER STORAGE PROJECT OFFICE

WESTERN AREA POWER ADMINISTRATION

By: _____
Manager
Colorado River Storage Project Office
Western Area Power Administration
Salt Lake City, Utah

COUNTY OF MONTROSE, COLORADO
EASTERN MONTROSE COUNTY WEED
MANAGEMENT COMMISSION

ATTEST:

By: _____

Title: _____

Title: _____

Address: _____

APPENDIX E

**WAPA ORDER 6460.1: RIGHT-OF-WAY MANAGEMENT GUIDANCE
FOR DANGER TREES, ENVIRONMENTS, AND ACCESS ROUTES**

U.S. Department of Energy

ORDER



WAPA 6460. 1

DATE: 03-01-95

SUBJECT: RIGHT OF WAY MANAGEMENT GUIDANCE FOR DANGER TREES,
ENCROACHMENTS, AND ACCESS ROUTES

1. PURPOSE. This Order delegates and clarifies responsibilities to the maintenance managers and establishes guidance and organizational support for the maintenance and safe operation of Western Area Power Administration (WAPA) rights-of-way (ROW).
2. SCOPE. The provisions of this Order apply to all organizational elements of WAPA.
3. REFERENCES. See Attachment 1.
4. DEFINITIONS.
 - a. Danger Trees. Trees located within or adjacent to the easement or permit area that present an immediate hazard to the facility or have the potential to encroach within the safe distance to the conductor as a result of bending, growing, swinging, or falling toward the conductor.
 - b. Emergency Situations. An emergency situation occurs when there is not time to notify a landowner or Government entity prior to removing a danger tree and the tree poses an immediate danger to WAPA's facility as well as the welfare of the public and WAPA's maintenance personnel.

DISTRIBUTION:
All Supervisors - WAPA-Wide
Maintenance

INITIATED BY:
Division of Lands and
Division of Power System

- c. Encroachments. Encroachments are those uses or developments that occur within the transmission line easement or permit area that impair WAPA's rights to operate and maintain the facilities or present a safety hazard. Examples of potential encroachments are houses, businesses, signs, light structures, outbuildings, landfills, roadways, etc.
 - d. Maintenance Manager. The individual located in the Area or District Office who is accountable for managing maintenance and/or operations functions. For example, in the Loveland Area Office this would be the Assistance Area Manager for Maintenance; in the Huron District Office this would be the District Manager.
 - e. WAPA Authorized Representative. The WAPA field representative in the area or district who has the authority to take a maintenance action. (This will be the Area Manager or his designee).
5. POLICY. The Maintenance Managers have the authority and responsibility for maintenance of WAPA's transmission line easement and permit areas in a manner to ensure the safe and reliable operations of the line, as well as to protect the environment, the well-being of the public, and WAPA's maintenance personnel. This responsibility includes the routine maintenance of access routes; vegetation management, especially danger trees; identification of potential encroachments; and positive landowner relations. Area Realty Officers, Area Environmental Managers, Area Safety Managers, And, when necessary, the Headquarters Office of General Counsel and Division of Lands will provide support to Maintenance Managers. Through this program, it will be WAPA's long-term goal to significantly reduce, if not eliminate, tree cutting and trimming activities.
6. BACKGROUND. WAPA's easements are acquired across private land while permits are WAPA's rights to maintain vegetation, including danger trees, to challenge a use that is considered to impair or encroach upon WAPA's rights, and to access the transmission line are dictated by the language in contract easements

across private land and in terms and conditions specified in Federal RIGHT-OF-WAY permits. generally associated with ROWs across Federal lands.

- a. Private Land. Generally, the easement contract language provides for the perpetual right to access, construct, operate, and maintain the transmission line facility in a manner that ensure safe operation and system integrity.
 - (1) Vegetation Management and Control. Responsibility for these functions are often WAPA's and may, based upon the terms of the easement contract, require compensation to the landowner for damages to crops or trees. Contract language may also specify that "orchards" are allowed under the conductor. Contracts are generally reviewed by the Area Realty Officers to determine the extent of WAPA's right to maintain or clear vegetation, including removal of danger trees.
 - (2) Landowner's Use of the Easement Area. Easement contracts specify WAPA's rights to operate and maintain the transmission line facilities, often including the right of access. Where landowners have added uses or developments in the easement area, the Maintenance Managers must determine, through the review of the easement contract, whether the use or development must be removed or mitigated to protect WAPA's rights.
 - (3) General Access Rights Language. Language defining WAPA's access rights is usually provided in the easement contract. To ensure that open and safe access is available across private land, the easement contract must be thoroughly and verified to identify access routes and any restrictions that regulate their use.
- b. Government Land. ROW permits are usually issued for a specific term and specify stipulations or conditions associated with vegetation management, compatible land uses, and access rights.

- (1) Vegetation Management and Control. Responsibility for these functions are WAPA's but are restricted based upon land and resource plans that dictate tree removal or trimming criteria within and adjacent to the ROW area.
- (2) ROW Use and Development. Uses or developments within WAPA's ROW are authorized by the Government entity managing the land and are usually reviewed and concurred upon by a WAPA authorized representative prior to the use being allowed.
- (3) Access Routes. Access routes are normally authorized by separate permits or agreements and contain specific terms and conditions that may restrict the season of use and rights for upgrading of the authorized access routes. Federal land agencies often times restrict access during specific seasons of the year to limit or control WAPA's access as well as public access.

7. RESPONSIBILITIES.

- a. Area Managers. Provide oversight of the ROW maintenance program in their respective areas.
- b. Area Office Maintenance Managers. Develop long-term strategies and programs, in coordination with Area safety, environmental, and realty personnel, to resolve danger tree, vegetation, encroachment, and access problems in and along WAPA's transmission line easements and ROW permit areas.
- c. Area Safety Managers. Support the Maintenance Managers in providing interpretation of Occupational Safety and Health Administration guidance for resolution of danger tree problems around energized conductors as well as ensuring the Area ROW program meets WAPA's safety goals and objectives.

- d. Area Office Environmental Managers. Support the Maintenance Managers in ensuring that maintenance activities employed to resolve danger tree, vegetation, encroachment, and access problems are in compliance with environmental laws and regulations.
 - e. Area Realty Officers. Support the Maintenance Managers in the identification and resolution of danger tree, vegetation, encroachment, public relations, and access problems. The Area Realty Officers also provide coordination in working with the landowners and have the responsibility of identifying land rights, including vegetation control rights.
 - f. General Counsel. Provides legal advice, counsel, and representation in the pursuit of available legal remedies in the resolution of danger tree, vegetation, encroachment, and access problems.
 - g. Headquarters Director, Division of Lands. Provides real property acquisition support and realty advice to the Maintenance Managers and Area Realty Officers in resolving danger tree, vegetation, encroachment, and access problems.
8. GENERAL GUIDANCE. As a component of each Area Office's routine maintenance activities, each Maintenance Manager will develop a ROW management program, including performance measures, for his area of responsibility and will coordinate its development and implementation with Area safety, environmental, and realty personnel as well as Headquarters Division of Lands and Office of General Counsel, when necessary. For the purpose of this guidance, vegetation management and control shall pertain to danger trees. This program will include a long-term strategy to inventory WAPA's rights as they pertain to danger trees, restrictions to use and developments, and access. The program will identify potential problem areas or situations to be resolved and the resolution process.

- a. Danger Tree Management. It shall be the responsibility of the Area Realty Officers to inventory the vegetation management rights, including any compensation rights to landowners, on a transmission line project on an as-needed basis. The following guidance is provided for tree management practices within and adjacent to easement areas as they pertain to private land and ROW permit areas as they pertain to Government land. Prior to danger tree removal, efforts will be made to notify landowners through coordination with the Area Realty Officers. Such notifications or attempts to notify landowners shall be documented.

(1) Easements on Private Land.

- (a) Where provided in the easement contract, the Maintenance Managers may remove all danger trees within and adjacent to the easement that present an existing or potential hazard to the facility and/or human life.
- (b) Compensation shall be paid to the landowner when specifically addressed in the easement contract; otherwise, the Maintenance Managers have discretion in mitigating the removal of trees, including reasonable compensation to the landowner and/or the planting of low growing vegetation suitable in meeting environmental requirements.
- (c) Where the easement contract does not provide for the rights to remove danger trees in or adjacent to the easement area, the Maintenance Managers have discretion in removing such trees after notification to the landowner and negotiating any damages with the landowner. Headquarters Office of General Counsel and Division of Lands will provide assistance and consultation to support the Maintenance Managers and support the future expansion of easement rights to include tree removal.

- (d) Where easement contracts specify that trees may only be topped or trimmed within the easement area, the Headquarters Division of Lands Office will support the Maintenance Manager in obtaining modifications to the contract to allow tree removal, where necessary.

(2) ROW Permits on Government Land.

- (a) Where provided in the ROW permit, the Maintenance Managers may remove danger trees within the permit areas.
- (b) Where land use plans or permit terms dictate that trees may only be topped within the permit areas, the Headquarters Division of Lands will support the Maintenance Manager in obtaining modifications to the ROW permit to allow tree removal, where necessary.
- (c) Where the ROW permit does not provide for the removal of danger trees in or adjacent to the ROW, the Maintenance Managers have discretion in removing such trees after notification to the Federal land managers. Headquarters Division of Lands will provide support to the Maintenance Managers to expand ROW rights to include tree removal.

- (3) Tree Removal Criteria. The following table provides criteria for tree removal or trimming when the clear distance from the nearest point on a tree to the conductor is less than the distances specified for the voltage shown. The distances shown in the table were taken from the Power System Safety Manual, 1994, Appendix B, Table B-1 and increased by 5 feet to allow for tree growth. The Maintenance Managers have discretion

in applying a more stringent criteria based upon the danger tree problems, landownership, terrain, and contract easement or permit rights to remove such trees.

| TRANSMISSION LINE RIGHT-OF-WAY DANGER TREE REMOVAL REQUIREMENTS | |
|--|---|
| Line Voltage | Minimum Clearance Between Conductor and Danger Trees |
| 69 kV | 15 feet |
| 115 kV | 15 feet 8 inches |
| 138 kV | 16 feet 4 inches |
| 161 kV | 16 feet 8 inches |
| 230 kV | 18 feet |
| 345 kV | 20 feet 4 inches |
| 500 kV | 24 feet |

- (4) Customer Focus. It is WAPA's policy that landowners are our customers. Maintenance Managers have the responsibility to ensure early notification to the private landowner or government entity prior to the removal activity within or adjacent to easement or permit areas. Where emergency removal of danger trees is necessary within or adjacent to the easement or permit areas and prior notice was not possible, the Maintenance Manager is responsible for initiating or coordinating notification after the fact. The Area Realty Officers will provide support in mitigating such actions.

b. Encroachments.

- (1) The Maintenance Managers shall be accountable for identifying potential encroachments. The Area Realty Officer is accountable for verification

and resolution. Where encroachments are found to be compatible with WAPA's rights, a license will be issued by the WAPA authorized representative. Where the encroachment is found to be incompatible, the Realty Officer shall coordinate the removal or mitigate the use or development. The Area Realty Officer may consult or ask assistance from the Headquarters Division of Lands and Office of General Counsel in those cases involving complex legal issues and landowner investments.

- (2) For situations where uses or developments are located within ROW permit areas on Government land that appear to impair WAPA's rights to operate and maintain its facilities, the Area Realty Officer will be responsible for contacting the Government entity and resolving the problem. If necessary, the Area Realty Officer may consult with or ask assistance from the Headquarters Division of Lands and Office of General Counsel.

c. Access Routes.

- (1) To ensure safe, reliable access to WAPA's facilities for maintenance purposes, it shall be the responsibility of the Maintenance Managers to identify and locate access routes in support of facility maintenance programs across private and Government land, where necessary. Maintenance Managers have the discretion to reopen blocked access routes where WAPA's right of access is being impeded. Area Realty Officers will be responsible to respond to the Maintenance Managers when requested to coordinate the reopening of such routes with the landowners and/or Government agency and will be supported by the Headquarters Division of Lands and Office of General Counsel, when necessary.
- (2) Where new access is needed across private land, the Area Realty Officer must consult with the Area Environmental Manager and the Headquarters Division of Lands to develop an acquisition plan to obtain access

easements. Where access is needed across Government land, the Area Realty Officer shall perform the same coordination as for private land except that WAPA will obtain ROW permit amendments. In either case, WAPA will strive to obtain access routes with the fewest restrictions as to season of use or impacts to resources.

J.M. Schafer
Administrator

REFERENCES

1. DOE 4300.1C, Real Property Management, of 06-28-92, which establishes Department of Energy policies and procedures for the acquisition, use, inventory, and disposal of real property or interests therein.
2. WAPA 5400.1A, ENVIRONMENTAL CONSIDERATIONS IN THE PLANNING, DESIGN, CONSTRUCTION, AND MAINTENANCE OF POWER FACILITIES AND ACTIVITIES, of 11-10-94, which describes environmental requirements that may be necessary to support maintenance activities.
3. WAPA Engineering Manual (EM) 6460.3, PROPERTY DAMAGE INVESTIGATION APPRAISAL AND SETTLEMENT, of 10-20-88, which establishes policy for the quick investigation and settlement for all legitimate damages caused by activities of WAPA personnel or contractors on the right-of-way resulting from construction, reconstruction, operation, and maintenance activities.
4. WAPA EM 6404, CONSTRUCTION MANAGEMENT PRACTICES AND PROCEDURES, Chapter V, Real Estate, of 02-20-90, which establishes responsibilities for the acquisition of real estate, in support of construction projects, and the allowance for other uses of the real estate through an authorization process.
5. WAPA Power System Maintenance Manual, Chapter 12, JOB HAZARD ANALYSIS, of November 1991.
6. WAPA Power System Operations Manual, of 1994.
7. WAPA Power System Operations Manual, Chapter, 1, POWER SYSTEM SWITCHING PROCEDURE, of July 1993.
8. Chain Saw Operations Guideline, of July 1992.

9. Transmission Line Right-of-Way Handbook, of February 1990, which provides an overview of right-of-way requirements, encroachment identification and resolution, and damage claim settlement.

APPENDIX F
SAMPLE SURVEY FORM

Right-of-Way Vegetation Survey

Page _____ of _____

| Region | | Line # | | Line Name | | | | Date | | | | Inspector | | | |
|---|-----------|--------|------------|---|------------------|--------------|-----------------------------|--|---------|-------------------|-----------------|---------------------------|---------------------------|----------------------------------|--|
| | | Codes* | | | | | Right-of-Way Floor | | | Right-of way Edge | | | | | |
| Structure Grid Number | Structure | Access | Vegetation | Span Length (feet) | Cleared Width | R/W Width | Brush Area (sq. feet) | Spray | Reclear | Screens | Danger Trees | Sides (linear feet) | Widen (linear feet) | Remarks Treatment Year | |
| From: | | | | | | | | | | | | | | | |
| To: | | | | | | | | | | | | | | | |
| To: | | | | | | | | | | | | | | | |
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| To: | | | | | | | | | | | | | | | |
| To: | | | | | | | | | | | | | | | |
| Total(s) | | | | | | | | | | | | | | | |
| Codes* | | | | | | | | | | | | | | | |
| Structure (Type) | | | | Access (Roads/Trails) | | | | Vegetation (Type) | | | | | | | |
| 1. Lattice 3. Wood Pole | | | | 1. None 4. Road Needs Repair | | | | 1. Native Vegetation 3. Undesirable | | | | | | | |
| 2. Steel Pole 4. "H" Frame | | | | 2. 4-WD Trail 5. Trail Needs Repair | | | | 2. Crop 4. Desirable | | | | | | | |
| | | | | 3. Graded Road 6. Road Needs to be Built | | | | 5. Desirable and Undesirable | | | | | | | |

APPENDIX G

EXAMPLES OF NON-PETROLEUM-BASED OILS FOR BASAL SPRAYING

PENEVATOR

OIL SURFACTANT FORMULATIONS FOR BASAL & DORMANT STEM
APPLICATIONS

**IMPROVES WETTING
ENHANCES SPRAY COVERAGE
ALLOWS QUICK UPTAKE
IMPROVES PENETRATION
INCREASES CONTACT ACTIVITY
GIVES UNIFORM DROPLET DISTRIBUTION
AVAILABLE WITH TRAIL BLAZER BASAL 2000 -RED or BLUE COLORANT**

PENEVATOR 9 and **PENEVATOR BASAL OIL** are maximum performance oil-surfactant packages now available for industrial and forestry postemergence weed and wood plant herbicide applications. The **PENEVATOR** line was developed by Exacto Chemical Company after the research and testing of many different types of select oils, surfactants and emulsifiers. Testing proved that the oil needed would have to be effective enough to allow penetration and activation of herbicides through the bud and bark area of woody plants. Yet this oil would have to be user friendly and environmentally safe. The surfactant would have to allow quick wetting, and uniform droplet distribution for increased coverage, while the emulsifiers would keep them all together in the package and in the spray tank.

This total package met the criteria for **PENEVATOR 9** and **PENEVATOR BASAL OIL** products. **PENEVATOR 9** is a spray oil adjuvant/basal oil formulation for basal and dormant stem applications.

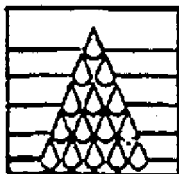
PENEVATOR 9 can be used in either oil based or water based solutions. **PENEVATOR BASAL OIL** is an oil formulation for basal bark, cut stump and other low volume woody plant herbicide applications.

PENEVATOR 9 and **PENEVATOR BASAL OIL** are not crop oil concentrates. **PENEVATOR** formulations are strong enough to replace diesel fuel yet safe enough to be environmentally compatible. **PENEVATOR 9** and **PENEVATOR BASAL OIL** can be used in non-crop application sites only on Utility Rights-of-Way, Highway Rights-of-Way, Railroad Rights-of-Way, Substations, Plant Sites, Forestry and more.

PENEVATOR products are also available with exacto's **TRAIL BLAZER BASAL 2000 RED** and/or **BLUE** colorant if desired. **BASAL 2000** is an herbicide colorant that gives an applicator a visual aid to identify the spray. Follow-up evaluations are also made easy by the long lasting colormark of **BASAL 2000**.

PENEVATOR is available in 2 1/2 gallon containers and 15, 30 and 55 gallon poly drums. The 15 gallon poly drum has a top side handle for easy handling and dispensing. All poly drums have an attached valve and are available in short-fill quantities (per your specification) for herbicide mixing.

Manufactured By:



EXACTO
CHEMICAL COMPANY

P.O. BOX 90
SOLON MILLS, IL 60080
800-798-9791/815-675-6060

PENEVATOR 9

PENEVATOR/ACTIVATOR

PENEVATOR 9 is a non-crop spray oil adjuvant/basal oil formulation

PENEVATOR 9 is designed to increase the penetration and activation of herbicides in post emergence weed and woody plant applications.

Principal functioning agents:

| | |
|---|-----|
| Refined Paraffinic Oil | 83% |
| Mixture of Surfactants and selected Emulsifiers | 17% |

CAUTION:

Keep out of reach of children. Harmful if swallowed. Avoid contact with eyes, skin and clothing. Avoid breathing spray mist. If sprayed into eyes, flush thoroughly with water and seek medical attention.

Garlon 4 is a registered Trademark of Dow Elanco

DORMANT STEM/POSTEMERGENCE WEED APPLICATIONS SUGGESTED USAGE RATES:

| | |
|--------------------------|-----------------|
| Low Volume Applications | .5-1 Qt/Acre |
| High Volume Applications | 1 Qt/100 Gallon |

NOTE: Use rates may vary. Late season applications may require doubling rates. (See note below)

BASAL APPLICATIONS SUGGESTED USAGE RATES:

PENEVATOR 9 can be used at dilution ratios of 1:4 (20%) or 1:3 (25%) when following the herbicide manufacturers label recommendations.

EXAMPLE: To make a 1:3 (25%) mixture of *Gordon 4 and PENEVATOR 9, use 1 part (25%) of *Gordon 4 and 3 parts (75%) of PENEVATOR 9

NOTE: Use rates may vary dependent on environmental conditions and applications. Increase rates as necessary for additional wetting and penetration. Always follow recommendations and labeled rates of herbicide manufacturers.

WARRANTY

EXACTO warrants that this product, when used as directed, is reasonably fit for use as designated on this label. EXACTO MAKES NO WARRANTY OF FITNESS AND MERCHANTABILITY. EXACTO'S maximum liability for breach of this warranty shall not exceed the purchase price of this product. In no event shall EXACTO be liable for indirect or consequential damages. This warranty shall not be changed by oral or written agreement unless signed by a duly authorized officer of EXACTO.

MANUFACTURED BY:



P.O. Box 90
Solon Mills, IL 60080
800-799-9761/815-675-6050

PENEVATOR

BASAL OIL

PENEVATOR BASAL OIL is a unique blend of highly refined Aliphatic Hydrocarbon Oils plus penetrants.

PENEVATOR BASAL OIL increases the penetration and effective uptake of woody plant herbicides. PENEVATOR BASAL OIL is designed for industrial and forestry Right-of-Way and other non-crop Basal applications, that previously required diesel fuel or Kerosene as a penetrant.

Active ingredients:

100% Aliphatic Based Oil + Penetrants

CAUTION:

Keep out of reach of children. Harmful if swallowed. Avoid contact with eyes, skin and clothing. Avoid breathing spray mist. If sprayed into eyes, flush thoroughly with water and seek medical attention.

Garlon 4 is a registered Trademark of Dow Elanco

BASAL APPLICATIONS SUGGESTED USAGE RATES:

PENEVATOR BASAL Oil can be used at dilution ratios of 1:4 (20%) or 1:3 (25%) when following the herbicide manufacturers label recommendations.

EXAMPLE: To make a 1:3 (25%) mixture of *Gordon 4 and Penevator 9, use 1 part (25%) of *Gordon 4 and 3 parts (75%) of Penevator 9

NOTE: Use rates may vary dependent on environmental conditions and applications. Increase rates as necessary for additional wetting and penetration. Always follow recommendations and labeled rates of herbicide manufacturers.

WARRANTY

EXACTO warrants that this product, when used as directed, is reasonably fit for use as designated on this label. EXACTO MAKES NO WARRANTY OF FITNESS AND MERCHANTABILITY. EXACTO'S maximum liability for breach of this warranty shall not exceed the purchase price of this product. In no event shall EXACTO be liable for indirect or consequential damages. This warranty shall not be changed by oral or written agreement unless signed by a duly authorized officer of EXACTO.

MANUFACTURED BY:

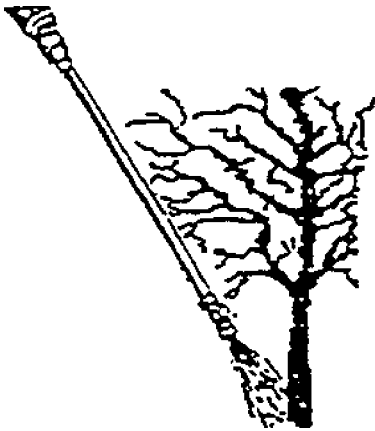


P. O. Box 90
Solon Mills, IL 60080
800-799-9761/815-675-6050

JLB OIL PLUS

DIRECTIONS FOR USE:

—JLB Oil Plus is a basal oil spray adjuvant that is formulated to mix with oil-soluble herbicides as a ready-to-use basal oil. Read herbicide label for rates and mixing instructions. The 25 gallons in a 30 gallon drum allows room for mixing in the herbicide if the user prefers.



Streamline, or thinline, basal applications are usually used to treat the juvenile bark of undesirable hard-woods. It is best suited for stems of 3 inches or less in diameter at breast height. Treatment is usually made in a 1.5 to 2 inch wide band, on one side only, at 10 to 24 inches above the ground. On larger stems, or difficult to control species, treatments should be made to both sides of the stem.

—The usual application method is to use a backpack and spray through a Spraying Systems Model 30 Gunjet, or equivalent. A Teejet .0002 or .0003 spraying tip, or equivalent, is often used. Refer to the herbicide label (e.g. Garlon 4) for further instructions.

JLB Oil Plus is suitable for controlling undesirable hardwoods in both pine and hardwood stands. It is a useful tool for wildlife management areas, both game management and endangered species.

SPECIMEN LABEL

JLB OIL PLUS

SPRAY ADJUVANT FOR BASAL APPLICATIONS
OF BRUSH CONTROL HERBICIDES

Active Ingredients: 100% blend of Aliphatic Hydrocarbon
Oils plus Limonene Penetrants

THE ONLY BASAL OIL WITH THE ADDITIONAL PLUS OF CIDE-KICK TO BOOST PENETRATION. JLB OIL PLUS IS A READY-TO-USE BASAL OIL & ELIMINATES THE NEED FOR DIESEL AND KEROSENE.

CAUTION: May cause skin and eye irritation. Harmful if swallowed.

Keep out of reach of children. See below for additional precautions and antidotes.

CAUTION

Do not take internally. Avoid skin and eye contact. **KEEP OUT OF REACH OF CHILDREN.**

FIRST AID

If swallowed: Do not induce vomiting. Get medical help.

If in Eyes: Flush with large amounts of water. Get medical attention.

If Breathed: Remove individual to fresh air. If affected, get medical attention.

Combustible

DIRECTIONS FOR USE

JLB Oil Plus is a Basal Oil Spray adjuvant that is formulated to mix with oil-soluble herbicides as a ready-to-use Basal Oil. Read herbicide label for rates and mixing instructions.

| Areas to be treated | Plants to be treated | Type of Application |
|--|--|---|
| Utility Rights-of-Way, Roadsides, Fencerows, and other industrial sites. | Brush species that could interfere with power lines, road side maintenance, safety, etc. | Low volume Basal, Streamline Basal, or other applications that penetrate the bark of the desired brush targets. |
| Forest Conifer Release and Site Preparation. Hardwood Stands. | Hardwood brush that competes with desired Conifers and Hardwoods. | See Above..... |

CONDITIONS OF SALE

We warrant that this product conforms to the chemical description on the label and is reasonably fit for the purpose set forth on the label when used according to directions under normal use conditions. THERE ARE NO OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. This warranty does not extend to the handling or use of this product contrary to label instructions or under abnormal conditions or under conditions not reasonably foreseeable to seller, and buyer assumes all risk of any such kind.



JLB INTERNATIONAL CHEMICAL, INC.

P.O. Box 6006 • Vero Beach, Florida 32964-6006
(800) 228-1833 or (407) 562-0555
FAX (407) 778-2490

CAUTION

KEEP OUT OF REACH OF CHILDREN

FLASH POINT: 155°F—Combustible. The use of AACCESS in concentrated form or in dilutions of 10% or more could cause defoliation or burn to vegetation.

NOTE: Weather conditions may have an effect on the amount on herbicide necessary. Warm, sunny days require less; cool and cloudy days require more.

AACCESS is non-corrosive to metal and chemical resistant hose; In continued use it is detrimental to rubber and plastic.

STORAGE AND DISPOSAL

PROHIBITIONS: Do not contaminate water, food or feed by storage or disposal.

STORAGE: Keep pesticide in original container. Do not put concentrate or dilute into food or drink container. Protect from temperatures below 0°F. Store in a cool, dry place.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved disposal facility.

CONTAINER DISPOSAL: Triple rinse or equivalent. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedure approved by State and local authorities.

GENERAL INFORMATION

AACCESS™ Penetrator is used to increase the activity and effectiveness of agricultural chemicals, such as herbicides and harvest aid materials. For general use as a surfactant-penetrant with chemicals in fallow programs such as Land-master, and Roundup.

AACCESS™ PENETRATOR

- Penetrating Activator
- Non-Ionic
- Biodegradable
- Water Miscible
- Improved Low Odor

ACTIVE INGREDIENT: 100% Limonene and related isomers plus selected emulsifiers.

AACCESS is a trademark of Cornbell Chemical Company, McCook, Nebraska

CAUTION

Keep Out of Reach of Children

Wear goggles or face shield, rubber gloves, and long sleeved clothing when handling. DO NOT get in eyes, on skins, or clothing. Avoid breathing vapors or mist. Use with adequate ventilation. Wash thoroughly after handling. Keep container closed during storage.

ANTIDOTE: If swallowed, do NOT induce vomiting. Get immediate attention. In case of skin contact, flush thoroughly with water.

MANUFACTURED FOR
CORNBELT CHEMICAL COMPANY
P.O. Box 410/McCook, NEBRASKA

| DIRECTIONS FOR USE | |
|-------------------------|--|
| TYPE OF APPLICATION | LOW VOLUME GROUND AND AERIAL APPLICATION |
| | per acre |
| Pre-Harvest | 1-2 pints |
| Harvest-Aid | 1-2 pints |
| Rights-of-Way foliar | 1-3 Quarts |
| Forest Site Preparation | 1-2 quarts |
| Aquatic - Surface | 1-2 Quarts |
| Aquatic - Submerged | 1-2 Gallons |
| Eco-Fallow | 1-2 pints |
| Turf | 1 Quart |

| DIRECTIONS FOR USE | | |
|-------------------------|--------------------------------|-------------|
| TYPE OF APPLICATION | HIGH VOLUME GROUND APPLICATION | |
| | per 100 gal. | per acre |
| Pre-Harvest | 1-2 pints | 2-3 pints |
| Harvest-Aid | 1-2 pints | 2-3 pints |
| Rights-of-way foliar | 1-2 quarts | 1-3 quarts |
| Forest Site Preparation | 1-2 quarts | 1-2 quarts |
| Aquatic - Surface | 1-3 quarts | 1-2 quarts |
| Aquatic - Submerged | 1-3 gallons | 1-2 gallons |
| Eco-Fallow | 1 quart | 1 quart |
| Turf | 1 quart | 1 quart |

Comments: Percent concentration of AACCESS varies with total volume used per acre. Do not exceed 10 percent concentration by volume.

Note: AACCESS can be used with pesticides other than herbicides and should be used at the rate of 1.4 to 1/2 percent by concentration.

AACCESS is highly compatible with Land-master[®], Cyclone[®], Gramoxone[®], Glean[®], Brominal[®], Bronate[®], Cythion[®], Furadan[®], Banvel[®], Oust[®], Telar[®], Roundup[®], Ally[®], Phenoxies, and other materials that call for the use of premium grade concentrated spray adjuvant.

AACCESS[®] - Trademark of Cornbelt Chemical Co.

Roundup[®] - Trademark of Monsanto Co.

Land-Master[®] - Trademark of Monsanto Co.

Brominal[®] - Trademark of Rhone-Poulenc Inc.

Bronate[®] - Trademark of Rhone-Poulenc Inc.

Cythlon[®] - Trademark of American Cyanamid

Furadan[®] - Trademark of FMC Corp.

Cyclone[®] - Trademark of I.C.I.

Gramoxone[®] - Trademark of I.C.I.

Banvel[®] - Trademark of Sandoz Corp.

Glean[®] - Trademark of Dupont Co.

Oust[®] - Trademark of Dupont Co.

Telar[®] - Trademark of Dupont Co.

Ally[®] - Trademark of Dupont Co.

CHARACTERISTICS

AACCESS Penetrator is a byproduct of the forest industry, a low viscosity oil.

AACCESS is compatible with most aquatic and terrestrial herbicides.

AACCESS is a wetting agent, activator and penetrant all in one.

AACCESS helps break down the waxy cuticle on the leaf surface, allowing a more effective uptake of the herbicide.

CONDITIONS OF SALE: 1. CORNBELT CHEMICAL CO. (Cornbelt) warrants that this material conforms to the chemical description on the label and is reasonably fit for use as directed hereon. Cornbelt neither makes nor authorizes any agent or representative to make, any other warranty of FITNESS or of MERCHANTABILITY, guarantee or representation, express or implied, concerning this material.

2. Critical and unforeseeable factors beyond Cornbelt's control prevent it from eliminating all risks in connection with the use of chemicals. Such risks include, but are not limited to, damage to plants and crops to which the material is applied, lack of complete control, and damage caused by drift to other plants or crops. Such risks occur even though the product is reasonably fit for the uses stated hereon and even though label directions are followed. Buyer and user acknowledge and assume all risks and liability (except those assumed by Cornbelt under 1 above) resulting from handling, storage, and use of this material.

Surfactants in AACCESS are exempt from the requirements of tolerance under Title 40, CFR 200.1001(d).

APPENDIX H
CONVERSION TABLES

CONVERSION TABLES

The following tables can be used to determine the amount of pesticide, liquid or dry formulation, needed per unit area to give the rate recommended for effective control.

Liquid Conversion Factors

1 gallon = 4 quarts or 8 pints or 3,785 cc or 128 fluid ounces

1 quart = 2 pints or 4 cups or 946 cc or 32 fluid ounces

1 pint = 2 cups or 473 cc or 16 fluid ounces

1 cup = 16 tablespoons or 236.5 cc or 8 fluid ounces

1 tablespoon = 3 teaspoons or 15 cc or 0.5 fluid ounces

Weight Conversion Factors

1 pound = 16 ounces or 454 grams

1 ounce = 28.4 grams

cc = cubic centimeter

Plot Size Factors

1 rod = 16.5 feet

1 square rod = 16.5 x 16.5 feet or 272 square feet

1 acre = 160 square rods

1 acre = 43,560 square feet

Application Factors

1 cup per square rod = 10 gallons per acre

1 pint per square rod = 20 gallons per acre

1 quart per square rod = 40 gallons per acre

1 gallon per square rod = 160 gallons per acre

Metric Conversions

| Symbol | When you know | Multiply by | To find | Symbol |
|--------|---------------|-------------|-------------|--------|
| lb | pounds | 0.45 | kilograms | kg |
| pt | pints | 0.47 | liters | l |
| qt | quarts | 0.95 | liters | l |
| oz | ounces | 30 | milliliters | ml |
| a | acres | 0.4 | hectares | ha |
| ha | hectares | 2.5 | acres | a |

Conversions in this guide are pounds per acre to kilograms per hectare.
Example: 2lb/A to kg/ha = $2 \times 0.45 = .90$ kg/A $\times 2.5 =$ kg/ha.

Source: Whitson et al. 1993-94.

CONVERSION TABLE FOR LIQUID FORMULATIONS

Concentration of active ingredients in formulation

| | 1 | | 2 | | 2.5 | | 3 | | 4 | | 5 | | 6 | |
|-------------------------|---|--------|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|-----|-------|
| | (Cc or tbsp of formulation per 1,000 square feet) | | | | | | | | | | | | | |
| Rate desired lb/A | cc | tbsp | cc | tbsp | cc | tbsp | cc | tbsp | cc | tbsp | cc | tbsp | cc | tbsp |
| 1 | 87 | 5 1/4 | 43 | 3 | 35 | 2 1/2 | 29 | 2 | 22 | 1 1/2 | 17 | 1 1/4 | 14 | 1 |
| 2 | 173 | 11 1/2 | 87 | 5 1/4 | 69 | 4 2/3 | 58 | 3 1/4 | 43 | 3 | 35 | 2 1/2 | 29 | 2 |
| 3 | 260 | 18 1/3 | 130 | 8 2/3 | 104 | 7 | 87 | 5 1/4 | 65 | 4 1/3 | 52 | 3 1/2 | 43 | 3 |
| 4 | 348 | 23 1/4 | 174 | 11 2/3 | 139 | 9 1/4 | 116 | 7 3/4 | 87* | 5 3/4 | 70 | 4 2/3 | 58 | 3 3/4 |
| 5 | 434 | 29 | 217 | 14 1/2 | 174 | 11 2/3 | 145 | 9 2/3 | 109 | 7 1/4 | 87 | 5 3/4 | 72 | 4 3/4 |
| 6 | 521 | 34 3/4 | 260 | 17 3/4 | 208 | 13 3/4 | 174 | 11 2/3 | 130 | 8 2/3 | 104 | 7 | 87 | 5 3/4 |
| 7 | 608 | 40 1/2 | 304 | 20 1/4 | 254 | 16 1/4 | 203 | 13 1/2 | 152 | 10 | 122 | 8 | 101 | 6 3/4 |
| 8 | 694 | 46 1/4 | 347 | 23 | 278 | 18 1/2 | 231 | 15 1/2 | 174 | 11 2/3 | 139 | 9 1/4 | 116 | 7 3/4 |
| 9 | 781 | 52 | 390 | 26 | 312 | 20 3/4 | 260 | 17 1/3 | 195 | 13 | 156 | 10 1/2 | 130 | 8 2/3 |
| 10 | 867 | 57 3/4 | 433 | 28 1/4 | 347 | 23 | 289 | 19 1/4 | 217 | 14 1/2 | 173 | 11 1/2 | 144 | 9 2/3 |

*Example: To spray a 1,000 sq. ft. area at the rate of 4 lb/acre active ingredient using a formulation containing 4 lb/gal active ingredient, use 87 cc or 5 3/4 tablespoons of the 4 lb/gal formulation in the amount of carrier your application equipment is applying per unit area (1,000 sq. ft.)

Source: Whitson et al. 1993-94.

CONVERSION TABLE FOR DRY FORMULATIONS

| Rate desired lb/A | Concentration of active ingredients in formulation | | | | | | | | | | | | |
|-------------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|
| | 100% | 90% | 80% | 75% | 70% | 60% | 50% | 40% | 30% | 25% | 20% | 10% | 5% |
| 1 | 10 | 12 | 13 | 14 | 15 | 17 | 21 | 26 | 35 | 42 | 52 | 104 | 208 |
| 2 | 21 | 23 | 26 | 28 | 30 | 35 | 42 | 52 | 69 | 83 | 104 | 208 | 417 |
| 3 | 31 | 25 | 39 | 42 | 45 | 52 | 63 | 78 | 104 | 125 | 156 | 312 | 625 |
| 4 | 42 | 46 | 52 | 56 | 60 | 69 | 83* | 104 | 139 | 167 | 208 | 417 | 833 |
| 5 | 52 | 58 | 65 | 69 | 74 | 87 | 104 | 130 | 174 | 208 | 260 | 521 | 1,040 |
| 6 | 63 | 69 | 78 | 83 | 89 | 104 | 125 | 156 | 208 | 250 | 312 | 625 | 1,250 |
| 7 | 73 | 81 | 91 | 97 | 104 | 121 | 146 | 182 | 243 | 292 | 364 | 729 | 1,460 |
| 8 | 83 | 93 | 104 | 111 | 119 | 139 | 167 | 208 | 278 | 333 | 417 | 833 | 1,670 |
| 9 | 94 | 104 | 117 | 125 | 134 | 156 | 187 | 234 | 312 | 375 | 469 | 937 | 1,870 |
| 10 | 104 | 116 | 130 | 139 | 149 | 174 | 208 | 260 | 347 | 417 | 521 | 1,040 | 2,080 |

*Example: To treat a 1,000 sq. ft. area at the rate of 4 lb/A active ingredient using a formulation containing 50% active ingredient, use 83 grams of the 50% formulation in the amount of carrier your application equipment is applying per unit area (100 sq. ft.)

Source: Whitson et. al. 1993-94.

APPENDIX I
STATE CONTACTS/PHONE NUMBERS FOR
SPILL RESPONSE NOTIFICATION
(Current as of September 1999)

APPENDIX I

**STATE CONTACTS/PHONE NUMBERS FOR
SPILL RESPONSE NOTIFICATION
(Current as of September 1999)**

| <u>State</u> | <u>Agency</u> | <u>Phone No.</u> |
|--------------|---|--|
| Arizona | Dept. of Env. Quality | 602-257-2330 |
| California | Office of Emergency Services | 1-800-852-7550 or 916-262-1621 |
| Colorado | Dept. of Emergency Response | 303-756-4455 |
| Iowa | Dept. of Nat. Resources Emergency Response | 515-281-8694 |
| Kansas | Dept. of Health and Environment | 785-296-1679 (business hrs) 785-296-0614 (eve, weekend, holidays) |
| Minnesota | Pollution Control Agency | 651-649-5451 or 1-800-422-0798 |
| Montana | Disaster and Emergency Services | 406-841-3911 |
| Nebraska | Dept. of Env. Quality | 402-471-4230 |
| Nevada | Div. of Emergency Management | 775-687-4240 (business hrs.) 775-687-5300 (eve, weekend, holidays) |
| New Mexico | State Police | 505-827-9329 |
| North Dakota | State Radio/Dept. of Health | 1-800-472-2121 |
| South Dakota | Div. of Emergency Management | 605-773-3231 |

| <u>State</u> | <u>Agency</u> | <u>Phone No.</u> |
|--------------|---|---------------------------------|
| Texas | Natural Resource Conservation Commission | 512-239-2507 or 512-463-7727 |
| Utah | DEQ-Div. of Env. Response and Remediation | 801-536-4123 |
| Wyoming | Dept. of Env. Quality - Water Quality Division | 307-777-7781 |

Note: In cases of transportation spills (or if receive no answer at agency number), can also contact State Police/State Public Safety Department.

* These phone numbers may change frequently.

APPENDIX J

EXAMPLE HERBICIDE APPLICATION FORM

Western Area Power Administration Facility Weed Control Report

(See reverse side for instructions)

[illegible]


INSTRUCTIONS - FACILITY WEED CONTROL REPORT

Report all applications of herbicides at substation yards on this form.
Provide separate line entry for each herbicide used, each station, etc.
Blanks are provided for additional notes.

Use the following abbreviations.

WEATHER:

Arrow points downwind with
North at top of page.
3 is wind velocity symbol, see below.

EXAMPLE:  3B53

B: Bright Temp: °F
C: Cloudy
R: Rain
S: Snow

| Symbol | MPH | Description | Specifications |
|--------|-------|-----------------|---|
| 0 | 0-1 | Calm | Smoke rises vertically |
| 1 | 1-3 | Light air | Smoke drifts |
| 2 | 4-7 | Light breeze | Wind felt on face, leaves rustle |
| 3 | 8-12 | Gentle breeze | Leaves & small twigs in constant motion |
| 4 | 13-18 | Moderate breeze | Raises dust, loose paper |
| 5 | 19-24 | Fresh breeze | Small trees in leaf begin to sway |
| 6 | 25-31 | Strong breeze | Large branches in motion |

AREA TREATED - DESCRIPTION

R: Rock x: See attached sketch - traced
L: Lawn from Station Plot Plan.
S: Shrubs 5: 500 KV yard
_: _____ 2: 230 KV yard
_: _____ -: _____

CONTROL METHOD

B: Broadcaster or spreader
H: Hand held _____
T: Tractor mounted _____
_: _____

S: Spray
H: Hand held _____
T: Tractor mounted _____
_: _____

MATERIAL USED

HERBICIDE:

Type: Abbreviate per latest listing of approved herbicides
Amount: Show pounds (#) for dry herbicides. Show gallons or ounces (oz) for liquid herbicides.

RATE: Show pounds per acre (#/A) for dry application.
Show gallons per acre (g/A) of total solution for liquid application.
(Square feet (G') may be used in lieu of acre in both cases.)

APPL: Applicator List abbreviation below with full name.

| | |
|--|--|
| | |
| | |
| | |
| | |

APPENDIX K
EXAMPLE REQUEST FOR PROPOSAL (RFP) -
CONTRACTOR APPLICATION OF HERBICIDES

REQUEST FOR PROPOSAL (RFP)
FOR A VEGETATION MANAGEMENT PROGRAM

CONTRACT PERIOD: May 1, 1994 - December 31, 1994 (with option to extend 2 more years).

CONTRACT OFFICERS REPRESENTATIVE: Mark Hollenbeck, 303-240-6233

TECHNICAL REPRESENTATIVE: Art Roybal, 303-275-1728

All proposals in response to this invitation must be returned, sealed, and clearly marked with the title, due date and time due on the package. Sealed proposals must be received by Western Area Power Administration, Montrose District, Attn: XXXX XXXX, Montrose, CO, 81401 and post-marked no later than XXXXXX XX, 1994. Proposals will be open for public inspection.

Firm Name of Contractor: _____

Address: _____

Phone Number: _____

Authorized Signature: _____

(Type name and sign in ink)

SIGNER MUST BE AUTHORIZED TO CONTRACTUALLY OBLIGATE THE FIRM

TITLE: _____ DATE: _____

INTERVIEW: An interview may be part of the decision making process if Western deems it to be in its best interest.

AWARD: Although Western intends to award the resulting contract to one vendor, it reserves the right to do a multiple award if deemed to be in the best interest of the Government.

RFP DISCREPANCY: Should a respondent discover any significant ambiguity, error, conflict, discrepancy, omission or other deficiency in the RFP document, said respondent shall immediately notify the Contract Officers Representative or the

Technical Representative named on the signature page and request clarification/modification of the document.

ADDENDA/ORAL COMMUNICATION: Western may modify the RFP prior to the date fixed for submission of the RFP by issuance of one or more addenda to all parties who have been furnished the RFP. Addenda will be numbered consecutively.

Oral communication concerning the RFP shall not be binding, nor be cause for protesting any language of this procurement, nor in any way excuse the bidder for his obligations.

RFP COSTS: Costs incurred for developing the RFP are entirely the responsibility of the Contractor and shall not be chargeable to Western.

DISPOSITION OF RFP'S: All materials submitted in response to this RFP will become the property of Western and will become public record and available for review.

REQUEST FOR PROPOSAL

The Western Area Power Administration (Western) is requesting proposals for vegetation management services at substations, pole yards, microwave sites, and other facilities located throughout Western's Salt Lake City Area. Management objectives of Western's vegetation management program include the removal of all undesirable vegetation to prevent fire hazard, structural damage and interference, increased safety and visibility, improved site drainage, and selective control of noxious weed infestations. The solicitation of vegetation management services is twofold: (1) to remove all undesirable vegetation (bareground control) from substations, microwave sites, and pole yards, and (2) inventory and selectively control the growth of State/County designated noxious weeds.

I. SCOPE

The area where services will be provided is located within Western's Salt Lake City Area Office boundaries (see Appendix A). Facilities and fee-owned lands requiring vegetation management are located in Colorado, Utah, Wyoming, Arizona, and New Mexico. The selected Contractor will need to be licensed in the five (5) States mentioned above. Appendix B lists the number of acres at each site which require bareground control of vegetation and inventory/control of State/County noxious weeds on adjacent fee-owned Western land. Appendix C lists the nine (9) facilities requiring bareground control and the total amount (acres) of Western fee-owned property at each site. The total acres listed include the acre amounts listed in Appendix B requiring bareground control. The period of performance for this contract shall be from May 1, 1994, through December 31, 1994. In addition, up to two additional performance periods of similar length may be included at the option of the Government. The total duration of this contract, including the exercise of any options, shall not exceed December 31, 1996.

II. OBJECTIVES AND DESIRED RESULTS

The objective of this proposal is to sensitively manage the growth of vegetation at Western substations, microwave sites, pole yards, and other facilities, and control the spread of State/County targeted noxious weeds on Western fee-owned land.

Bareground control will be required within security fences. The management boundary for bareground control at substations will extend only 2 feet outside the security fence and include graveled surfaces outside of the fenced perimeter, such as driveways and parking areas. In order to comply with State/County Noxious Weed Control laws and management plans, Western will be controlling the growth of targeted weed species on fee-owned property. Therefore, it will be necessary to inventory and map the location of targeted noxious weeds on Western fee-owned property. Concurrent with the inventory and mapping effort, identified noxious weeds will be selectively controlled (spot treatment) on Western fee-owned lands surrounding transmission facilities.

Desired results of vegetation management services are:

1. Bareground Control At Substations, Microwave Sites, and Pole Yards - If vegetation occurs in the gravel surfaced area within one year following final acceptance of the work under these specifications, the Contractor shall return and retreat those areas requiring bareground control.

2. Noxious Weed Control

- Inventory and mapping of State/County targeted noxious weeds growing on Western fee-owned property.
- A 80 to 90 percent control after the first-season of the State/County target noxious weed species.
- After the second season, a minimum of 95 percent control of State/County target noxious weed species.
- A selective management approach that would control the State/County target noxious weed species but leave desirable low growing shrubs.
- No dead grass as a result of treatment(s).
- Selective control in areas with rare or endangered plants. Such areas will be identified by the Federal and/or State land administrators (e.g.,

Bureau of Land Management, U.S. Forest Service) and located by reference point. See Appendix B for those areas identified as having concerns with endangered species.

III. BEST MANAGEMENT PRACTICES

The Contractor shall review all specific work areas within the overall management area and propose to Western the best method(s) of managing the subject vegetation. Prescription herbicide treatment formulations will be selected based on vegetation to be controlled, area rainfall, conditions at the site, desired length of control, adjacent land use, and other factors. These methods shall be further referred to as best management practices.

The best management practices proposed must further take into account potential impacts on public health, water quality and fisheries, land uses, plants and animals (including endangered species).

IV. TASKS

As a minimum, the following tasks will be provided:

A. FIRST YEAR

1. Field review of Western fee-owned land where State/County targeted weeds are growing and specific herbicides which will be applied.
2. Developing best management practices for each facility where bare ground control is needed and fee-owned land that is infested with State/County targeted noxious weeds.
3. Developing a schedule for the overall management of vegetation (bareground and noxious weed control) indicating timetables and work locations.

4. Obtaining approval of herbicides, best management practices and schedules from Western Contracting Officers Representative (COR).
5. Proceeding with the approved work (i.e., applications for bareground control and inventory, mapping, and application for control of State/County noxious weeds).
6. Obtaining first year approval of services performed.

B. SECOND YEAR

1. Field review of vegetation management work with COR for effectiveness of first year's efforts in obtaining vegetation-free areas (bareground control) and preventing the spread of noxious weed infestations on Western fee-owned lands.
2. Continuation of herbicide applications for bareground and noxious weed control at sites not included during the first performance period.

Responder may propose additional tasks or activities if they will substantially improve the results of the service. Western will decide as to the merit of these activities to the Government.

V. SERVICES AND INFORMATION PROVIDED BY WESTERN

Western will provide a Contracting Officers Representative (COR) to oversee all vegetation management activities on Western fee-owned land. The COR will be on site or reachable by telephone within a 24 hour period. In the event the COR is on vacation or unavailable, a substitute shall be designated.

Water is not available at all sites. Where water is available from an outdoor source, it will be furnished by the Government without charge to the Contractor. When water is not available at the site, the Contractor shall provide his/her own water supply source. Toilet facilities are not available and electrical service is not provided.

VI. QUESTIONS

Questions/concerns regarding this request for proposal will be addressed by Mark Hollenbeck, Contract Officers Representative, (303) 240-6233, or Art Roybal, Technical Representative, (303) 275-1728. An addendum will be issued if the content of the questions/concerns deem it necessary.

VII. SUBMISSION OF PROPOSALS

All proposals must be sent to:

Western Area Power Administration
Montrose District Office
ATTN: Mark Hollenbeck, M5002
1800 South Rio Grande Avenue
Montrose, CO 81401

Proposals must be postmarked no later than XXXXX XX, 1994. Late proposals will not be accepted. One original and two (2) copies must be submitted. Proposals are to be sealed in mailing envelopes or packages with responder's name, address, and the words, "Response to Request for Proposal" clearly written on the outside. Each copy of the proposal must be signed by an authorized member of the company.

VIII. SCHEDULE OF UNIT PRICES FOR SERVICES

The Contractor shall develop a schedule of unit prices for bareground control and noxious weed inventory and selective treatment of noxious weeds. The unit price shall be in terms of herbicide application per acre. Western will specify the herbicide products to use for bareground control (see Appendix B). The unit price quoted shall be compensation in full for all labor, materials, equipment and other incidentals necessary to complete the work as specified. Prices and terms of the proposal as stated must be valid for the length of the contract. Retreatment of sites that require bareground weed control for one growing season will be at the Contractor's additional expense.

IX. PROPOSAL CONTENTS

The following will be considered minimum contents of the proposal. Any omissions may result in rejection of the proposal.

- A. A restatement of the objectives to clarify the responder's view of the nature of the service.
- B. A schedule of unit prices for services based on application of herbicides specified by Western for bareground control (Appendix B) and likely noxious weed infestations.
- C. A description of each of the best management practices proposed.
- D. A listing of numbers of personnel, type of application equipment, and materials to be used on the project.
- E. Additional areas of expertise, skills, knowledge, and capabilities that the responder possesses.

X. EVALUATION AND INTERVIEW

All proposals received by the deadline will be evaluated by a panel. This panel will consist of representatives of the Western Area Power Administration. If an interview is deemed necessary, responders will be expected to discuss vegetation management on Western fee-owned land and their proposed best management practices. Selection of a Contractor will be based on the following criteria:

SELECTION CRITERIA

FACTOR

Expressed Understanding of the Proposed Objectives and Concerns

Qualifications of Company (experience, performance references)

Qualifications of Personnel Assigned to Provide Services (education, experience, number on work crew)

Best Management Practices (methods, materials, environmental standards and procedures, herbicides, control sensitivity)

Equipment (type, condition, age, etc.)

Cost (bareground control per acre, noxious weed spot treatment per acre)

XI. WORKER'S COMPENSATION

Successful Contractor(s) must provide acceptable evidence of compliance with workers' compensation insurance coverage requirements, prior to contract award.

XII. PAYMENT

Payment will be based upon the actual acreage treated. Payment will be processed when:

- A. The job is complete for any given year.
- B. Work has been inspected and approved.
- C. All required documentation of products used and services performed are submitted.
- D. A properly filled out invoice in duplicate has been submitted to Western.

APPENDIX L
EXAMPLE SCOPE OF WORK (SOW) -
CONTRACTOR APPLICATION OF HERBICIDES

CONTENTS OF APPENDIX L:

STATEMENT OF WORK

ATTACHMENT A LOCATION MAP

ATTACHMENT B FACILITY LOCATIONS

ATTACHMENT C FEE-OWNED LAND REQUIRING NOXIOUS WEED
INVENTORY AND MAPPING DURING 1994
GROWING SEASON

**WESTERN AREA POWER ADMINISTRATION
SALT LAKE CITY AREA OFFICE
MONTROSE DISTRICT**

**STATEMENT OF WORK
FOR VEGETATION MANAGEMENT AT FACILITIES
AND NOXIOUS WEED CONTROL ON FEE-OWNED LAND**

CONTENTS

1. PURPOSE AND SCOPE
 2. UTILITIES
 3. SECURITY
 4. SAFETY
 5. MATERIALS APPROVAL
 6. MATERIAL STORAGE
 7. CONTRACTOR RESPONSIBILITY
 8. HERBICIDE APPLICATION
 9. POSTAPPLICATION CLEANUP AND SOLID WASTE DISPOSAL
 10. PAYMENT
-
1. PURPOSE AND SCOPE

The Contractor shall furnish all equipment, tools, herbicides, drift control agents, spray pattern indicator, additives, supplies, transportation, and labor required for application of herbicides in facilities and adjacent areas as designated by attached site specific diagrams and in accordance with the specifications written below. Vegetation management services performed by the Contractor are twofold: (1) to remove all undesirable vegetation (bareground control) from substation, microwave, and other facility sites, and (2) inventory and selectively control the growth of State/County noxious weeds on Western fee-owned land. Vegetation management services performed under this statement of work will be conducted at facilities located in Western Area Power Administration's Salt Lake City Area (see Appendix A). This statement of work is for the 1994 vegetation growing season (May to December 1994). Work performed under this contract shall be subject to inspection by the Contracting Officer's Representative (COR).

2. UTILITIES

2.1 Water:

- a. Water is not available at all sites. Where water is available from an outdoor source, it will be furnished by the Government without charge to the Contractor. The Contractor shall avoid all waste.
- b. When water is not available at the site, the Contractor shall provide his/her own water supply source.

2.2 Sanitation:

Toilet facilities are not available.

2.3 Electricity:

Electrical service is not provided.

2.4 Telephone:

If telephone service is required, the Contractor shall arrange for its installation and shall bear all costs.

3. SECURITY

Western buildings and grounds shall remain secured at all times. Entrance to facilities will be coordinated with the COR.

4. SAFETY

Contractor personnel shall comply with all applicable provisions of the State Labor and Industries Safety and Health Regulations, U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) Standards 29 CFR 1910 and 29 CFR 1926 and other applicable Federal, State, and local regulations.

4.1 Safety Orientation:

The Contractor, and all employees to be utilized under this contract, shall be required to take a safety orientation. This will require all contract personnel to view a mandatory safety video and take a tour of a Western substation with a Western representative. This tour will point out the hazards involved while working in an energized high-voltage substation, the Western rules and regulations governing this work, and entry procedures into Western substations. After these requirements have been satisfactorily completed, a list of the Contractor employees, who have orientated to work in Western substations, will be established by Western. The Contractor and his employees must be on this orientation list before entering a Western substation, switchyard, or performing any work in said facilities. The Contractor will not allow any person on the job site who has not received the safety orientation and is not on the orientation list. The Western COR may decline to orientate any Contractor employee and may remove any Contractor employee from the orientation list.

The Contractor shall be required to notify the COR 14 days prior to start of herbicide application for work scheduling and orientation.

All employees shall wear, as a minimum, full-length pants, short sleeves or T-shirt, and above-the-ankle leather work boots.

4.2 Hard Hats:

Approved hard hats (non-metallic) shall be worn while inside fenced substation and other designated hard hat areas.

4.3 Application Equipment:

- a. When liquid herbicide is being applied, the pressure at the spray nozzle shall not exceed 30 pounds per square inch.

- b. The spray pattern shall be fan shaped. No solid stream is permitted. All spray guns shall have an automatic shut off feature.
- c. Contractor must have all necessary parts and tools available in order to perform general upkeep and/or maintenance of equipment.
- d. All spray units will be leak-proof and spill-proof. All spray equipment will be sealed so that leakage will not occur from tanks, pumps, spray hose connections, etc. Any equipment found not meeting this requirement will be just cause for stopping work. Repeated failure to eliminate such leakage will be just cause for cancellation of the contract.

Truck, mix, unit, valves, hoses, meters, continuous agitation system, etc. must be in good working condition.

- e. Contractor must be able to transport herbicides from one job site to another.
- f. Tank truck and/or mix unit must be able to acquire and take on water from rural, city, and/or county water sources.
- g. Applicator vehicles, including equipment, will not exceed 8 feet in height above the ground. All vehicles will need prior approval by the COR before entry to substation yards.

4.5 Compliance:

- a. If the Contractor fails or refuses to promptly comply with the requirements of this clause, the COR may notify the Contractor of any noncompliance and indicate to the Contractor the action to be taken. Such notice, either oral or written, when served to the Contractor at the site of work, shall be deemed sufficient. The

Contractor shall, after receipt of such notice, immediately correct the condition to which attention has been directed.

- b. In the event the Contractor fails or refuses to promptly comply with the compliance directive issued under 4.3.a., the Contracting Officer may issue an order to suspend all or any part of the work. Failure of the Contracting Officer or his authorized representative to order discontinuance of any or all of the Contractor's operations shall not relieve the Contractor of his responsibility for the safety of personnel and property. The Contractor shall not be entitled to any extension of time, nor to any claim for damage or excess costs by reason of either the directive or the suspension order. When satisfactory corrective action is taken, an order to resume work will be issued.
- c. When Contractor employees enter the energized substation yard or whenever work is in proximity to the Government's normally energized transmission facilities, the Contractor shall, at all times, provide for the safety of the employees and take necessary precautions to protect the Government's facilities from accidental contact that will cause an outage or damage to the facilities.

4.6 Safety Inspector:

Western will provide a qualified electrical worker for all work inside the energized facility or in situations where safety inspectors would be necessary.

- a. While in energized facilities, the electrical worker shall maintain direct control over movement of Contractor personnel and equipment. Splitting of crews will not be permitted.
- b. The on-site safety inspector will approve access to restricted areas within the energized facility.

5. MATERIALS APPROVAL

- 5.1 Western has specified in Appendix A the herbicides to apply within the security fences and adjacent gravel areas at Western facilities for bareground control and which herbicides to apply for noxious weed control on fee-owned land at Curecanti Substation. Western is requiring the addition of a spray pattern indicator for all liquid spray applications. The Contractor shall submit to the COR the following for approval prior to application of any herbicide:

Pre-Application Submittal Requirements

- a. Herbicide products, drift control agents, and spray pattern dyes which will be applied for both bareground and noxious weed control at each site listed in Appendix A and the proposed application rates.
 - b. Manufacturer's Specimen Label, directions for use of material, use precautions, and storage and disposal directions.
 - c. Material Safety Data Sheets.
 - d. Equipment that will be used in the application process.
- 5.2 Mailing address:

Western Area Power Administration
Montrose District Office
ATTN: Mark Hollenbeck, M5002
1800 South Rio Grande Avenue
Montrose, CO 81401

- 5.3 The COR may obtain samples of herbicide materials being applied for laboratory analysis.

6. MATERIAL STORAGE

Materials, chemicals (e.g., herbicides), or equipment cannot be stored on Western property.

7. CONTRACTOR RESPONSIBILITY

The Contractor must be currently licensed to apply pesticides in the State where the applications are conducted and experienced in all aspects of herbicide/pesticide application. The Contractor shall obtain all required Federal and State licenses and permits (including the submittal of pesticide use proposals for applications on lands administered by the Bureau of Land Management and U.S. Forest Service). He will provide competent supervision and take all necessary precautions to protect persons or property against injury or damage. The Contractor shall ensure that each employee entering the work site has experience, training, and, where required, the certification, skills, and knowledge necessary to safely and competently perform their assigned tasks. In addition, the Contractor shall ensure each employee receives initial work site safety orientation and continued safety and health training addressing the hazards associated with the work and the measures necessary to control or eliminate the hazards.

- 7.1 The Contractor shall NOT subcontract herbicide application. All herbicides will be applied by the Contractor who receives the contract award.
- 7.2 The Contractor shall determine if personal protective equipment and other health and safety related equipment is required for performing the work covered by this statement of work. The Contractor shall furnish all required equipment and ensure his employees use it. The Contractor shall provide all required medical monitoring, health physicals, and recordkeeping.
- 7.3 Proper application of herbicides is the sole responsibility of the Contractor. The Contractor shall comply with manufacturer's written directions. Liability for any damages to persons, animals, agricultural

crops or ornamentals, lakes, streams, and water systems due to contamination from drift, spills, leaching, runoff, absorption, or volatilization shall be the Contractors.

- a. Water supplies contaminated by the Contractor's activities shall be decontaminated by the Contractor at the Contractor's expense and to the applicable regulations.

7.4 If a reportable release of a hazardous substance occurs at the work site, the Contractor shall immediately notify the COR and the appropriate Federal and State agencies, as required by law.

- a. All chemical spills will be cleaned up immediately by the Contractor at his own expense and to the applicable regulations.

7.5 Performance of this contract shall be accomplished without unnecessarily interfering with other contract work or Government activities.

8. HERBICIDE APPLICATION

Herbicide application shall comply with manufacturer's recommendations in accordance with applicable regulations and as specified herein. All herbicides used for bareground and noxious weed control shall be pre-approved by the COR prior to application as specified in Section 5 of this statement of work. Drift control agents, where appropriate, shall be used per manufacturer's directions.

8.1 Daily contact with the COR or inspector will be made each morning for coordination of work.

- a. Depending on the facility site location and surrounding land, two types of herbicide applications will be needed, as described below.

For bareground control, a soil residual herbicide with a contact herbicide (as needed) should be applied. A list of Western sites

and herbicides to be applied is listed in Appendix B. Appendix B describes the locations of Western sites which require weed inventories and are located in sensitive environments (e.g., BLM designated Area's of Critical Environmental Concern). Any deviations from the herbicide use list will need to be approved by the COR prior to application.

For noxious weed control on adjacent fee-owned property, a selective postemergence herbicide should be applied. Appendix C lists the acres of Western fee-owned land at each facility site. Appendix C is inclusive of the acreage amounts listed for bareground control in Appendix B. The herbicide used should not kill grasses and other desirable vegetation. A "CAUTION" or "WARNING" precautionary statement should be present on the label. Restricted-use herbicides and those herbicides that have "DANGER" precautionary statements will not be allowed without prior approval.

All liquid mix applications shall contain a spray pattern indicator. Becker-Underwood, Inc. Hi-LIGHT blue spray pattern indicator, or equal, shall be applied at the manufacturer's maximum recommended rate. The COR may approve a lesser application rate if, in his opinion, spray application can be observed.

- b. Work performed during other than Western's standard schedule, 7 a.m. to 4:30 p.m., Monday through Friday, requires prior written approval by the Contracting Officer. Western shall be compensated for all unapproved overtime work involving their employees caused by actions of the Contractor or his agents.

- 8.2 The Contractor shall observe the Western boundaries and WILL confine all herbicide applications to those boundaries as identified on the attached diagrams.

- a. Contract acreage treated may vary by 10 percent at the discretion of the District COR to allow for entry roads, ditches, shoulder rock, or additional area not previously identified.
- 8.3 All overspray on buildings and substation electrical equipment shall be cleaned with a water and detergent solution. After cleaning, the affected areas so contaminated shall be thoroughly rinsed with clean water. This cleaning shall be performed prior to leaving the site. Failure to perform overspray cleaning will result in all work being suspended by the COR, with recommendations to the Contracting Officer to commence contract default action.
 - a. The Contractor shall cover all substation drains and catch basins to prevent contamination from herbicide application.
- 8.4 A daily report shall be completed by the Contractor. The Contractor's representative's name, State Herbicide Applicator's License number, and signature shall appear on each report. A copy of the signed report shall be submitted by the Contractor to the Contracting Officer with invoice submittal. No payment will be made for any work not documented by a daily report with all pertinent information (see Section 11.c, Payment).
- 8.5 Schedule:
 - a. Background vegetation control, noxious weed inventory, and selective noxious weed control shall be at those sites listed in Appendix A. See Appendix A for facility site specific information.
- 8.6 If the Contractor believes the technical specifications are in conflict with the material manufacturers labeled instructions, the Contracting Officer shall be notified immediately.
 - a. No herbicides are to be applied to a site until a resolution of the conflicting instructions are arrived at.

9. POSTAPPLICATION CLEANUP AND SOLID WASTE DISPOSAL

Cleanup is to be done during the progress of work and upon completion. All empty herbicide containers must be disposed of by the Contractor in accordance with applicable regulations. No empty pesticide containers will be disposed of on Western property. The Contractor is responsible for removal from Western property all litter and/or garbage generated by the Contractor, his employees, or representatives.

- 9.1 All evidence of overspray on equipment or buildings shall be thoroughly removed by washing.

10. WARRANTY

The Contractor shall guarantee that all areas treated for bareground control under this contract (except Shiprock Substation) are to remain weed free for at least one (1) growing season following application. Any additional application necessary during this period will be done at the Contractor's expense.

- 10.1 On all warranty performance requests, the Contractor shall respond and correct the deficiency within 14 days of notification.

11. PAYMENT

Payment will be made based upon actual acreage treated. Payment will be processed when:

- (a) Job is complete for any given year.
- (b) Work has been inspected and approved.
- (c) All Federal and State required recordkeeping documentation (and services performed) are submitted. Information should include:
 - 1. Date of application,

2. Place (facility) and size of area (square feet or acreage) treated.
 3. Name and manufacturer of herbicide applied, together with the EPA pesticide registration number and product lot number from the labels. Include name and manufacturer of spray marking dye and any drift control agents used.
 4. Method of application (equipment used, carrier).
 5. Weather conditions at time of application (wind speed, wind direction, temperature, rainfall, and humidity).
 6. Quantity/rate of herbicide applied (pounds of active ingredient per acre or quantity of product per acre).
 7. Any problems associated with the application of herbicides (e.g., noncompliance with environmental and health/safety laws or regulations).
 8. Other information/data as required by applicable Federal and State regulations.
- (d) A properly filled out invoice in duplicate has been submitted to:

Western Area Power Administration
ATTN: P. Gabriel, M1054
1800 South Rio Grande Avenue
Montrose, CO 81401

ATTACHMENT A
LOCATION MAP
(insert appropriate map)

APPENDIX L
ATTACHMENT B

MONTROSE DISTRICT
FACILITY LOCATIONS

The Contractor will be furnished feature maps of all Montrose District substations, pole yards, microwave sites and other facilities requiring herbicide application. All sites require an inventory of State/County target noxious weed species. One copy of each feature map should be marked with the locations and target noxious weed species present at the site. After the site inspection and mapping has been completed, noxious weed control efforts will be planned. This work will be in addition to bare ground weed control on the enclosed list of substations and the control of musk thistle, knapweed, and ragweed around Curecanti Substation.

Western prefers the work be completed in a sequence such as bareground control and noxious weed surveys on the eastern side of Montrose District be completed first.

All the sites listed below require an inventory of noxious weed during the next two (2) years. The nine (9) sites listed below with location descriptions are slated for bareground and selective noxious weed control during the 1994 calendar year.

Blue Mesa Substation
Curecanti Substation
Gunnison Substation
Skito Substation
North Gunnison Substation
Poncha Substation
Salida Substation
Bears Ears Substation
Brush Creek Tap
Flaming Gorge Substation
Hayden Installation
Craig Maintenance Facility
Vernal Installation

Tyzack Switchyard
Vernal Installation
Cahone Substation
Fairview Substation
Great Cut Substation
Pleasant View Substation
Ruin Canyon Substation
Dove Creek Substation
Shiprock Substation
Flagstaff Substation
Waterflow Substation
Glen Canyon Substation

1. Curecanti Substation

Location: Approximately 20 miles east of Montrose, Colorado. The substation lies on the north side of the Cimmaron River Valley. The river is 200 yards to the south of the substation which drains directly into the river. Down river are several municipalities which use water from the river for human and livestock consumption.

Bareground control herbicide required: Tank mix of KARMEX DF and ARSENAL

Total Area for Bareground Control: 5 acres

Application rate: Contractor supplied, COR approval required prior to spraying

Spray indicator: Required

Number of applications required: 1

Noxious weed control required: The Western owned land around Curecanti substation is infested with Musk Thistle, some Knapweed and Ragweed. Actual fee-owned land acreage is 110 acres. Approximately 15 percent of the acreage is area has weed growth and requires treatment.

Noxious weed control herbicide required: Transline by Dow Elanco

Application rate: Contractor supplied, COR approval required prior to spraying

Spray indicator: Required

Number of applications required: 2

2. Midway Substation

Location: North of Pueblo, Colorado at exit 19 on I-25 then west 4 miles. The location is on a high, dry plateau which generally drains to the east. The nearest river is several miles away. Public Service Company of Colorado has the eastern end of the substation and Western has the west end.

Bareground Control herbicide required: Tank mix of KARMEX DF and ARSENAL

Total Area for Bareground Control: 6.44 acres

Application rate: Contractor supplied, COR approval required prior to spraying

Spray indicator: Required

Number of applications required: 1

Noxious weed control required: Unknown at this time.

3. Salida Substation

Location: Poncha Junction west of Salida, Colorado behind Public Service Company of Colorado's Substation which is on State Highway 50. Drainage is to the south with a creek one-fourth of a mile away.

Bareground control herbicide required: Tank mix of KARMEX DF and ARSENAL

Total Area for Bareground Control: 0.2 acres

Application rate: Contractor supplied with COR approval required prior to spraying

Spray indicator: Required

Number of applications required: 1

Noxious weed control required: Unknown at this time.

4. Hayden Substation, Pole Yard, and Microwave Site

Location: East of Hayden, Colorado behind the generation station on the county road. Drainage is to the east and into the makeup water lake of the generation station. The substation is surrounded by agriculture land under cultivation. The listed pole yard and microwave site are adjacent to the substation.

Bareground control herbicide required: Tank mix of KARMEX DF and ARSENAL

Total Area For Bareground Control: 9.42 acres

Application rate: Contractor supplied with COR approval required prior to spraying

Spray indicator: Required

Number of applications required: 1

Noxious weed control required: Unknown at this time.

5. Rifle Substation and Microwave Site

Location: South of Silt, Colorado approximately 5 miles. Drainage is to the west toward agricultural land. The nearest waterway is several miles away. The listed microwave site is on the access road to the substation.

Bareground control herbicide required: Tank mix of KARMEX DF and ARSENAL

Total Area for Bareground Control: 2.33 acres

Application rate: Contractor supplied with COR approval required prior to spraying

Spray indicator: Required

Number of applications required: 1

Noxious weed control required: Unknown at this time.

6. Vernal Substation, Pole Yard, and Microwave Site

Location: Four miles east of Vernal, Utah. The listed microwave site and pole yard are adjacent to the substation. Drainage is to the east with the nearest waterway several miles away.

Bareground control herbicide required:

Total Area for Bareground Control: 4.52 acres

Application rate: Contractor supplied with COR approval required prior to spraying

Spray indicator: Required

Number of applications required: 1

Noxious weed control required: Unknown at this time.

7. Shiprock Substation

Location: Located on County Road 5 approximately 20 miles west of Farmington, New Mexico. The surrounding area is high desert with drainage to the south. The nearest river is the San Juan several miles away.

Endangered Species: This area of New Mexico has several endangered plant species. This substation is located on land administered by the Bureau of Land Management (BLM). All land surrounding Western's facility is administered by the BLM. The substation and surrounding land is designated by the BLM an "Area of Critical Environmental Concern." All spray operations must be coordinated with the BLM. This is the Contractor's responsibility to notify the BLM and advise of any spray operations at Shiprock substation.

Bareground control herbicide required: ROUNDUP

Total Area for Bareground Control: 24.77 acres

Application rate: Contractor supplied with COR approval required prior to spraying

Spray indicator: Required

Number of applications required: 1

Noxious weed control required: Unknown at this time.

8. Waterflow Substation

Location: Northeast of Shiprock Substation approximately 4 miles. According to BLM authorities in Farmington, New Mexico, this substation is located on Navajo Indian Reservation land. It is surrounded by BLM land and drains to the southeast. The San Juan river is several miles away.

Endangered Species: The same endangered plant species cautions as at Shiprock Substation should be observed.

Bareground control herbicide required: Tank mix of KARMEX DF and ARSENAL

Total Area for Bareground Control: 3.5 acres

Spray indicator: Required

Number of applications required: 1

Noxious weed control required: Unknown at this time.

9. Flagstaff Substation

Location: East of Flagstaff, Arizona to the Winona exit on I-40 then south along the transmission lines to the substation. The area is covered with range grass and pinon with some juniper trees. Drainage is to the east with the Little Colorado River many miles away.

Bareground control herbicide required: Tank mix of KARMEX DF and ARSENAL

Total Area for Bareground Control: 12.02 acres

Application rate: Contractor supplied with COR approval required prior to spraying

Spray indicator: Required

Number of applications required: 1

Noxious weed control required: Unknown at this time.

APPENDIX L
ATTACHMENT C

WESTERN AREA POWER ADMINISTRATION
FEE-OWNED LAND REQUIRING
NOXIOUS WEED INVENTORY AND MAPPING
DURING 1994 GROWING SEASON

ACRES - SITES IN MONTROSE DISTRICT

| <u>FID</u> | <u>FACILITY NAME</u> | <u>GRANTOR</u> | <u>ST</u> | <u>COUNTY</u> | <u>ACRES</u> | <u>TWP</u> | <u>RNG</u> | <u>SC</u> |
|------------|----------------------|------------------------|-----------|---------------|--------------|------------|------------|-----------|
| CCI | CURECANTI SUBSTATION | LOVELESS, ARLINGTON H | CO | MONTROSE | 110.00 | 48N | 6W | 9 |
| FLG | FLAGSTAFF SUBSTATION | USA (FS) | AZ | COCONINO | 29.20 | 21N | 9E | 24 |
| FLG | FLAGSTAFF SUBSTATION | USA (FS) | AZ | COCONINO | 2.35 | 21N | 9E | 24 |
| | FLAGSTAFF SUBSTATION | | | | 31.55 | | | |
| HDN | HAYDEN SUBSTATION | COLORADO-UTE ELEC. | CO | ROUTT | 80.00 | 6N | 87W | 18 |
| MID | MIDWAY SUBSTATION | WARD, W.T. ETAL | CO | EL PASO | 42.70 | 17S | 65W | 20 |
| RFL | RIFLE SUBSTATION | SWEENYS, INC. | CO | GARFIELD | 12.10 | 6S | 92W | 16 |
| SLA | SALIDA SUBSTATION | HOLMAN, EDWARD F. ETAL | CO | CHAFFEE | 0.69 | 49N | 8E | 9 |
| SLA | SALIDA SUBSTATION | WHITMAN, FRANK ETAL | CO | CHAFFEE | 0.69 | 49N | 8E | 9 |
| | SALIDA SUBSTATION | | | | 1.38 | | | |
| SHR | SHIPROCK SUBSTATION | USA (BLM) | NM | SAN JUAN | 44.93 | 30N | 16W | 24 |
| SHR | SHIPROCK SUBSTATION | USA (BLM) | NM | SAN JUAN | 115.00 | 30N | 16W | 24 |
| | SHIPROCK SUBSTATION | | | | 159.93 | | | |
| VNL | VERNAL SUBSTATION | COOK, ROBERT ETUX | UT | UINTAH | 1.90 | 5S | 22E | 8 |
| VNL | VERNAL SUBSTATION | MOON LAKE ELECTRIC | UT | UINTAH | 3.60 | 5S | 22E | 8 |
| VNL | VERNAL SUBSTATION | RICHENS, LYNN ETUX | UT | UINTAH | 8.20 | 5S | 22E | 8 |
| | VERNAL SUBSTATION | | | | 13.70 | | | |
| WTF | WATERFLOW SUBSTATION | USA (BLM) | NM | SAN JUAN | 8.15 | 30N | 15W | 17 |
| | | | | | 496.51 | | | |
| | | | | | -47.00 | | | |
| | | | | | 449.51 | | | |

APPENDIX M
FEDERAL INTERAGENCY COMMITTEE MOU
FOR THE MANAGEMENT OF NOXIOUS WEEDS

MEMORANDUM OF UNDERSTANDING

FOR THE

ESTABLISHMENT OF A FEDERAL INTERAGENCY COMMITTEE

FOR THE MANAGEMENT OF NOXIOUS AND EXOTIC WEEDS

This Memorandum of Understanding (MOU) is made and entered into by and among the signatory Federal Agencies referred to as the Federal Agencies.

I. PURPOSE

The purpose of this MOU is to establish the Federal Interagency Committee for Management of Noxious and Exotic Weeds (hereafter referred to as FICMNEW). The FICMNEW will work cooperatively to accomplish an ecological and integrated approach to the management of noxious and exotic weeds (hereafter referred to as management) on Federal lands and technical assistance on private lands.

The Federal Agencies propose to work together within the scope of their respective authorities toward a common goal of achieving sustainable, healthy ecosystems that meet the needs of society.

Additionally, all Federal Agencies desire to achieve the advancement of knowledge and skills, good land stewardship practices and public awareness of noxious and exotic weed issues and management. This cooperation is in the parties' mutual interest.

II. CHARTER FOR FICMNEW

The FICMNEW is charged with coordinating the identification of the extent and impacts of noxious and exotic weeds for the Secretaries of the involved Departments through the appropriate Assistant Secretaries.

This committee will coordinate a Federal Government approach which includes the development of agency needs, and will make recommendations to departmental leadership on research technology transfer, and management actions. The committee will present yearly progress reports on the status of the noxious and exotic weed problem.

III. DUTIES OF FICMNEW

1. Share the scientific and technical expertise of various agencies related to noxious and exotic weed management.
2. Encourage Federal employees to work collaboratively to enhance their resource management capabilities and advance the State of knowledge of the art and science of technical assistance and management of noxious and exotic weeds by an open interchange of knowledge, skills, abilities, and resources.
3. Cooperate in the development of technical workshops, continuing education courses, natural resource management conferences, scientific publications, and demonstrations. Examples could include special training sessions and conferences concerning technical aspects of noxious and exotic weeds.
4. Meet annually, or as needed, to review the progress and opportunities of implementing the MOU.

IV. IT IS MUTUALLY AGREED AND UNDERSTOOD BY AND AMONG THE SA PARTIES THAT:

1. Specific work projects or activities which involve the transfer of funds, services or property between the parties to this MOU will require the execution of separate agreements or contracts, contingent upon the availability of funds as appropriated by Congress. Each subsequent agreement or arrangement involving the transfer of funds, services, or property among the parties to this MOU must comply with all applicable statutes and regulations, including those

statutes and regulations applicable to procurement activities, and must be independently authorized by appropriate statutory authority.

2. This MOU in no way restricts the Federal Agencies from participating in similar activities or arrangements with other public or private agencies, organizations, or individuals.

3. Nothing in this MOU shall obligate the Federal Agencies to expend appropriations or to enter into any contracts or other obligations.

4. The initial committee chairs and principal contacts for this agreement are:

| | |
|-----------------------------|--------------------------------|
| Janette Kaiser | Lewis (Buck) Waters |
| USDA Forest Service | DOI, Bureau of Land Management |
| P.O. Box 96090 | 1849 C Street, NW (Rm. 204 LS) |
| Washington, D.C. 20090-6090 | Washington, D.C. 20240 |
| (202) 205-0847 | (202) 452-7760 |

5. Unless terminated under the terms of paragraph 6 below, this MOU will remain in full force and in effect; the MOU will be subject to review annually.

6. This MOU may be modified or amended upon written request of any party and the concurrence of the other. Any party may be removed from this MOU upon written notice to the other parties.

IN WITNESS WHEREOF, the parties hereto have executed this MOU as of the last written date below.

MIKE DOMBECK
Director, Bureau of Land Management
U.S. Department of the Interior

Date

JACK WARD THOMAS
Chief Forest Service
U.S. Department of Agriculture

Date

ROGER G. KENNEDY
Director, National Park Service
U.S. Department of the Interior

Date

MOLLIE BEATTIE
Director, Fish and Wildlife Service
U.S. Department of the Interior

Date

DANIEL BEARD
Commissioner, Bureau of Reclamation
U.S. Department of the Interior

Date

ADA DEER
Assistant Secretary, Indian Affairs
U.S. Department of the Interior

Date

F. EUGENE HESTER
Deputy Director, National Biological
Survey
U.S. Department of the Interior

Date

LONNIE J. KING
Acting Administrator, Animal and Plant
Health Inspection Service
U.S. Department of Agriculture

Date

E. E. FINNEY
Acting Administrator, Agricultural
Research Service
U.S. Department of Agriculture

Date

LEODREN WILLIAMS
Acting Administrator, Agricultural
Research Service
U.S. Department of Agriculture

Date

PAUL W. JOHNSON
Chief, Soil Conservation Service
U.S. Department of Agriculture

Date

LON HATAMILA
Administrator, Agricultural Marketing
Service
U.S. Department of Agriculture

Date

GRANT BUNTROCK
Administrator, Agricultural Stabilization
and Conservation Service
U.S. Department of Agriculture

Date

SHERRI W. GOODMAN
Deputy Under Secretary of Defense
(Environmental Security)
U.S. Department of Defense

Date

RODNEY E. SLATER
Administrator/Federal Highway
Administration
U.S. Department of Transportation

Date

TARA O'TOOLE
Assistant Secretary
Environment Safety and Health
U.S. Department of Energy

Date

JOHN PATRICK JORDAN
Administrator, Cooperative State
Research Service
U.S. Department of Agriculture

Date

(Note: Contact CSO - Art Roybal for
copy with original signatures if needed)

APPENDIX N

EXAMPLE SEEDING SPECIFICATION

SECTION III
DIVISION 5
SEEDING

5.1 SCOPE

The work covered by this Division consists of furnishing all materials, labor, and equipment and performing all operations for seeding of the areas indicated on the Drawings and/or specified herein. The scope shall consist of ground preparation, furnishing and planting approved seed, and furnishing and placing mulch. The areas to be seeded include all areas of Final Cover system, Borrow Area Reclamation, Flood Control Berms and Runoff Control Berms as indicated on the Drawings and described in these Specifications.

5.2 MATERIALS

5.2.1 Seed

Seed shall be certified seed of the latest season's crop and shall be delivered in original sealed packages bearing the producer's guaranteed analysis for percentages of mixtures, purity, germination, weed-seed content and inert material. Seed shall be labeled in conformance with U.S. Department of Agriculture rules and regulations under the Federal Seed Act and applicable state seed laws. Seed that has become wet, moldy, or otherwise damaged shall not be acceptable. Seed shall be purchased locally. The seed shall be distributed by a broadcast-type seeder or hand-broadcast.

The pure live grass seed mixture to be used shall be as follows:

| <u>Seed</u> | <u>Rate of Application</u> <u>Pounds Per Acre</u> |
|--------------------------------------|--|
| Little Bluestem | 1.0 |
| Side Oats Grama | 1.0 |
| Blue Grama | 0.3 |
| Western Wheat | 2.0 |
| Green Needlegrass | 1.0 |
| Switch Grass | 0.4 |
| Buffalo Grass | <u>0.6</u> |
| Total Pounds Pure Live Seed Per Acre | 6.3 |

5.2.2 Mulch

The Contractor shall furnish and uniformly place, after seeding, a minimum of 1 1/2 tons per acre of hay or straw mulch on all seeded areas. Mulch material may include clean areas or grain straw, or grass (not legume) hay, shall be reasonably free of seed heads, noxious weed seed, molds or other evidence of decomposition, and other objectionable material.

5.3 PREPARATION OF SEEDBED

All vegetation, weeds, brush, and rubbish shall be cleared and removed from areas to be seeded. The soil shall be tilled to a depth of at least 2 inches by plowing, discing harrowing, or by the use of rototillage machinery. The work shall be performed only during periods when beneficial results are likely to be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed by the Engineer. All seedbed preparation shall be performed parallel to the contours to reduce soil loss. After tilling, the seedbed shall be smoothed and firmed. In areas where equipment cannot be operated, such as around gas vents, the seedbed shall be prepared by hand.

5.4 PLANTING SEED

The specified mixture of grasses shall be uniformly distributed on the designated areas by means of an approved broadcast-type seeder or hand-broadcast.

The Contractor shall broadcast seed with approved gravity or cyclone types of spreading equipment. Broadcast seedings shall be covered to an average depth of 1/4 to 1/2 inch. Broadcast seeding shall not be permitted when wind velocity is such as to prevent uniform seed distribution. Recommended seeding rates shall be increased in these areas, as specified in paragraph 5.2 of this Division.

Seeding shall be done between mid-April to June 1, or from early August through September 1. Temporary or dormant seeding mixtures will be required if construction cannot be scheduled to meet these recommended seeding times. Areas will be seeded within 2 weeks of seedbed preparation.

Upon completion of plating of the seed, mulch shall be spread uniformly over the area and shall be crimped in.

5.5 HYDROMULCHING

As an alternate to other methods of seeding and mulching specified herein, application by an approved hydromulcher will be acceptable. Wood cellulose fiber mulch or other approved material to be used in hydromulching shall contain no germination or growth-inhibiting factors. It shall be dyed an appropriate color to allow visual metering of its application. The mulching material shall have the property of becoming evenly dispersed and suspended when agitated in water. When sprayed uniformly on the surface of the soil, the fibers shall form a blotter-like ground cover which readily absorbs water and allows infiltration to the underlying soil. Weight specifications from the suppliers, and for all applications, by air dry weight of the fiber, shall meet a standard equivalent of 10 percent moisture. The mulch materials shall be supplied in packages and marked to show the air dry weight content. Suppliers shall be prepared to certify that laboratory and field testing of their product has been accomplished and that it meets all the foregoing requirements. Recommended seeding rates shall be doubled.

The hydromulch slurry shall be prepared by adding the mulching material to the water slurry in the hydraulic seeder after the proportionate quantities of grass seed and fertilizer materials have been added. All slurry ingredients shall be mixed to form a homogeneous slurry. Slurry mixtures prepared more than 45 minutes prior to application are not acceptable. Using the color of the mulch as a metering agent, the operator of the hydraulic seeder shall spray-apply the slurry mixture uniformly to the prepared seedbed to correspond with per acre requirements of all materials. Wood cellulose fiber mulch shall be applied at a minimum rate of 1000 pounds per acre. The Contractor shall verify, by inspections of tank loading and spray applications that materials applied correspond to the per acre requirements.

5.6 ONE YEAR MAINTENANCE

The Contractor shall maintain the seeded areas during seed application and for a minimum of one year following substantial completion of the project. Any damages to

the seeded areas by the Contractor's operations shall be repaired by and at the expense of the Contractor. Final acceptance of seeded areas shall not be made until a good initial growth of grass has occurred. The Contractor shall produce a stand of grass that shall be alive, growing, and healthy at the end of 1 year. The grass shall be growing on at least 80 percent of the seeded area to a height of two inches. Areas on which these requirements are not met shall be reseeded at the expense of the Contractor until a stand of grass is produced.

5.7 MEASUREMENT AND PAYMENT

Measurement for payment of seeding shall be by the acre, surface measurement by surveying methods performed by the Contractor, to the nearest of one fourth (1/4) acre, of areas seeded in accordance with these Specifications. Payment shall be made at the Unit Price bid in the Bid Schedule for Item No.4 - Seeding, which unit shall include all seed, fertilizer, mulch, bed preparation, materials application, watering and all materials, labor, equipment, tools and incidentals to complete the work described for seeding including costs for the one year maintenance period described in this Division. Twenty-five (25) percent of the Final Payment for seeding will be held by the Owner which will be paid to the Contractor in quarterly installments providing the Contractor complies with the one year seeding maintenance requirement to the satisfaction of the Owner.

APPENDIX O
INFORMATION ON EZJECT® SYSTEM

EZJECT[®]

Selective Injection Herbicide Capsules

BY **Monsanto**

- Water soluble herbicide in capsules for stem injection.
- Controls undesirable woody brush, trees and vines — roots and all.

Keep out of reach of children.

CAUTION!

Read the entire label before using this product.
Use only according to label instructions.
Read "LIMIT OF WARRANTY AND LIABILITY" before buying or using.
If terms are not acceptable, return at once unopened.
REFORMULATION OR REPACKAGING IS PROHIBITED.

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

CAUTION!
HARMFUL IF SWALLOWED.
CAUSES EYE IRRITATION.

Avoid contact with eyes, skin or clothing.
Wash thoroughly with soap and water after handling.

FIRST AID: IF IN EYES, immediately flush with plenty of water. Get medical attention if irritation persists. Remove product from skin or clothing.

IF SWALLOWED, immediately induce vomiting as directed by medical personnel.
NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

In case of emergency involving this product,
Call Collect, day or night, (314) 694-4000.

Environmental Hazards

Do not apply directly to water or wetland (swamps, bogs, marshes or potholes). Do not contaminate water when disposing of equipment washwaters.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling.

Storage and Disposal

Do not contaminate water, foodstuffs, feed or seed by storage or disposal.

STORAGE:

Keep container closed to prevent spills and contamination. At the end of each use period, remove unused capsules from EZJET[®] capsule injection system. Replace unused capsules in original container and re-seal.

DISPOSAL:

Wastes resulting from the use of this product that cannot be used or chemically reprocessed should be disposed of in an landfill approved for pesticide disposal or in accordance with applicable Federal, state and local procedures.

This product is recommended for woody brush, tree and vine control in all noncropland sites, including forestry, roadsides, rights-of-way, industrial, residential, fencerows, railroads and aquatic sites.

For aquatic sites, this product may be injected into stems of trees and brush standing in water or wetlands. Do not apply directly to water or inject into stems below the water level.

Woody vegetation may be controlled by injection of EZJECT[®] selective injection herbicide capsules. Inject the capsules using only the EZJECT capsule injection equipment. The capsules must penetrate through the outer bark into living phloem tissue to provide effective results.

For trees with less than 2.5 inch DBH (diameter breast height), inject one capsule per stem.

Inject one capsule every 4 inches, evenly around the trunk of the tree, below all major branches.

Tree may be injected at any time of the year except when wood is frozen.

This product moves throughout the tree from the point of injection to all roots and shoots. Symptoms appear gradually (normally within 2 to 4 weeks), beginning with wilting, yellowing and browning of the foliage. This is followed by deterioration of all roots and shoots.

This product will control the following species:

| | | |
|----------------|----------------|-------------------|
| Alder | Hackberry | Pondersoa pine |
| Ash | Hawthorn | Poplar |
| Aspen, quaking | Hazel | Poplar, yellow |
| Big-leaf maple | Hemlock | Redbud |
| Birch | Hickory | Sagebrush |
| Black cherry | Locust, black | Salt Cedar |
| Boxelder | Locust, honey | Sassafras |
| Casara | Lodgepole pine | Sourwood |
| Ceanothus | Madrone | Sumac |
| Chamise | Manzanita | Sweet gum |
| Cherry | Maple | Tan oak |
| Cottonwood | Mountain maple | Vine maple |
| Dogwood | Oak | Waxmyrtle |
| Douglas fir | Persimmon | Western red cedar |
| Elderberry | Pin cherry | Willow |
| Elm | Poison ivy | |
| Eucalyptus | Poison oak | |

Specific recommendation for many species of woody brush, trees and vines, other than those listed above, are under development.

For additional product information, call 1-800-225-2883.

ACTIVE INGREDIENT

| | |
|--|--------|
| Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt | 83.5% |
| INERT INGREDIENTS: | 16.5% |
| | 100.0% |

Product protected by U.S. Patent No. 4,405,531. Other patents pending. No license granted under any non-U.S. patent(s).

LIMIT OF WARRANTY AND LIABILITY

This Company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes set forth in the Complete Directions for Use ("Directions") when used in accordance with those Directions under the conditions described therein. NO OTHER EXPRESS WARRANTY OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR MERCHANTABILITY IS MADE. This warranty is also subject to the conditions and limitations stated herein.

Buyer and all users shall promptly notify this Company of any claims whether based in contract, negligence, strict liability, other tort or otherwise.

Buyer and all users are responsible for all loss or damage from use or handling which results from conditions beyond the control of this Company, including, but not limited to, incompatibility with products other than those set forth in the Directions, application to or contact with desirable vegetation, unusual weather, weather conditions which are outside the range considered normal at the application site and for the time period when the product is applied, as well as weather conditions which are outside the application ranges set forth in the Directions, application in any manner not explicitly set forth in the Directions, moisture conditions outside the moisture range specified in the Directions, or the presence of products other than those set forth in the Directions in or on the soil, crop or treated vegetation.

THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE LIMIT OF THE LIABILITY OF THIS COMPANY OR ANY OTHER SELLER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT (INCLUDING CLAIMS BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE) SHALL BE THE PURCHASE PRICE PAID BY THE USER OR BUYER FOR THE QUANTITY OF THIS PRODUCT INVOLVED, OR, AT THE ELECTION OF THIS COMPANY OR ANY OTHER SELLER, THE REPLACEMENT OF SUCH QUANTITY, OR IF NOT ACQUIRED BY PURCHASE, REPLACEMENT OF SUCH QUANTITY. IN NO EVENT SHALL THIS COMPANY OR ANY OTHER SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES.

Buyer and all users are deemed to have accepted the terms of this LIMIT OF WARRANTY AND LIABILITY which may not be varied by any verbal or written agreement.

*Registered trademark of Monsanto Company.

MONSANTO COMPANY

AGRICULTURAL PRODUCTS

ST. LOUIS, MISSOURI 63167

© MONSANTO COMPANY 1991

EPA Reg. No. 524-435

4x48 Tube Cylinders

4800 capsules

(Each Tube contains 25 capsules)

EPA Est 62171-MS-001

896 31-000 11/5300

MONSANTO MATERIAL SAFETY DATA

Page 1 of 3

| |
|---|
| <p>MONSANTO PRODUCT NAME EZJECT™ Selective Injection Herbicide Capsules</p> |
|---|

MONSANTO COMPANY
800 N. LINDBERGH
ST. LOUIS, MO 63167
EMERGENCY PH. NO. (CALL COLLECT) (314) 694-4000
DATE PREPARED: NOVEMBER, 1989

PRODUCT IDENTIFICATION

| | |
|--------------------------|--|
| EPA Registration Number: | 524-435 |
| Synonyms: | MON 20033 |
| Chemical Name: | Not Applicable, Formulated Product |
| Active Ingredient: | Glyphosate; N-(phosphonomethyl) glycine, in the form of its isopropylamine salt..... 83.5% |
| Inert Ingredients: | 16.5% |
| | 100.0% |

| | |
|---|---|
| CAS Reg. No.: | 1071-83-6 |
| DOT Proper Shipping Name: | Not Applicable |
| DOT Hazard Class/I.D. No.: | Not Applicable |
| DOT Label: | Not Applicable |
| Reportable Quantity (RQ) Under U.S. CERCLA: | Not Applicable |
| U.S. Surface Freight Classification: | Rail - Chemicals N.O.I.B.N. Truck - Plant Growth Regulator |

SARA Hazard Notification
Hazard Categories Under Criteria of
SARA Title III Rules (40 CFR Part 370): Immediate

Section 313 Toxic Chemical(s): Not Applicable

Hazardous Chemical(s) Under OSHA Hazard Communication Standard:
Not applicable

WARNING STATEMENTS

Keep out of reach of children.
CAUTION!
HARMFUL IF SWALLOWED
CAUSES EYE IRRITATION
REFORMULATION OR REPACKING IS PROHIBITED

PRECAUTIONARY MEASURES

Avoid contact with eyes, skin or clothing
Wash thoroughly with soap and water after handling.
Do not apply directly to water or wetland (swamps, bogs, marshes or potholes).
Do not contaminate water when disposing of equipment washwaters.

EMERGENCY AND FIRST AID PROCEDURES

FIRST AID:

| | |
|---------------|--|
| IF IN EYES: | Immediately flush with plenty of water. Get medical attention if irritation persists. Remove product from skin or clothing. |
| IF ON SKIN: | Flush with water. Wash clothing before reuse. |
| IF SWALLOWED: | Immediately induce vomiting as directed by medical personnel. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. |

MONSANTO MATERIAL SAFETY DATA

Page 2 of 3

OCCUPATIONAL CONTROL PROCEDURES

EYE PROTECTION: Avoid all contact of this product with the eyes. No special protection equipment is required during normal conditions of handling and use of EZJECT™ Selective Injection Herbicide Capsules. (See Effects of Exposure in Health Effects Summary). However, if the product is handled in a fashion which causes release to the air, prudence would dictate the wearing of chemical goggles. During manufacturing or other operations where there may be significant potential for eye contact, wear chemical goggles and have eye flushing equipment available.

SKIN PROTECTION: Although EZJECT™ Selective Injection Capsule does not present a significant skin concern, minimize skin contamination by following good industrial practice. Wash hands and contaminated skin thoroughly after handling.

RESPIRATORY PROTECTION: EZJECT™ Selective Injection Capsule is not likely to present an airborne exposure concern under normal use. Use NIOSH/MSHA approved respiratory protection equipment if needed for exposure during abnormal handling conditions - filling cartridges. Consult respirator manufacturer to determine appropriate type of equipment for given application. Observe respirator use limitations specified by NIOSH/MSHA or manufacturer. Respiratory programs must comply with 29 CFR 1910.134.

VENTILATION: No special precautions recommended.

AIRBORNE EXPOSURE LIMITS:

PRODUCT: EZJECT™ Selective Injection Herbicide Capsule (100% by wt.):
OSHA PEL: None established ACGIH TLV: None established

FIRE PROTECTION INFORMATION

Flash Point: This material is not combustible as tested by the Tag Closed Test.

Extinguishing Media: Use appropriate extinguishing media for exposure fire.

Special Firefighting Procedures: Firefighters or others who may be exposed to mists or products of combustion from exposing fire should wear full protective clothing. Equipment should be thoroughly cleaned after use.

Unusual Fire and Explosion Hazards: None

REACTIVITY DATA

Stability: Based on accelerated aging studies at temperatures to 60°C (140°F), EZJECT™ Selective Injection Capsules may be expected to be stable for several years at normal temperatures of use and storage (<95°F).

Incompatibility: Not known

Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen

Hazardous Polymerization: Will not occur

HEALTH EFFECTS SUMMARY

The following information summarizes human experience and results of scientific investigations reviewed by health professionals for hazard evaluation of EZJECT™ Selective Injection Herbicide Capsules and development of Precautionary Statements and Occupational Control Procedures recommended in this document.

EFFECTS OF EXPOSURE

EZJECT™ Selective Injection Herbicide Capsules consist of a formulation of glyphosate isopropylamine salt mechanically pre-loaded into an EZJECT injection cartridge. This formulation is considered only slightly irritating to eyes and skin. Because this product is packaged using cartridges, the potential for exposure to the formulation is expected to be minimal under normal conditions of handling and storage. On the basis of available information, exposure to this product in its pre-packaged form is not expected to produce significant adverse human health effects when recommended safety precautions are followed.

TOXICOLOGICAL DATA

Data from laboratory studies conducted by Monsanto are summarized below:

Single exposure (acute) studies indicate:

| | |
|-------------------|---|
| Oral - | Slightly toxic (Rat LD ₅₀ - Approximately 5,000 mg/kg) |
| Dermal - | Practically Nontoxic (Rabbit LD ₅₀ - >5,000 mg/Kg) |
| Eye Irritation - | Slightly Irritating (Rabbit) |
| Skin Irritation - | Slightly Irritating (Rabbit, 4-hr exposure) |

No skin allergy was observed in guinea pigs following repeated skin exposure.

MONSANTO MATERIAL SAFETY DATA

Page 3 of 3

HEALTH EFFECTS SUMMARY - CONTINUED

COMPONENTS

GLYPHOSATE

Glyphosate was practically nontoxic orally (rats) or after skin application (rabbits). It was severely irritating to rabbit eyes and nonirritating to rabbit skin. Following repeated exposures (90-days) to glyphosate in their feed, decreased weight gains were noted in mice, while no treatment-related effects occurred in rats. Following repeated skin exposure (3 weeks) to glyphosate, slight skin irritation was the primary effect observed in rabbits. No skin allergy was observed in guinea pigs following repeated skin exposure. There was no evidence of effects on the nervous system, including delayed effects in chickens (repeat oral doses) or cholinesterase inhibition in rats (single oral doses). Reduced body weight gain and effects on liver tissues were observed with long-term (2-year) feeding of glyphosate to mice. No adverse effects were observed in long-term feeding studies with rats (2-year) and dogs (1-year). Glyphosate did not produce tumors in any of these studies. No birth defects were noted in rats and rabbits given glyphosate orally during pregnancy, even at amounts which produced adverse effects on the mothers. No effects were seen on the ability of male or female rats to reproduce when fed glyphosate for three successive generations. Glyphosate has produced no genetic changes in a variety of standard tests using animals and animal or bacterial cells.

PHYSICAL DATA

| | |
|-------------------|----------------------------|
| Appearance: | tan to light blue solid |
| Odor: | Musty |
| pH: | 4.6 (1% solution in water) |
| Specific Gravity: | 41 lbs/ft ³ |

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

SPILL, LEAK & DISPOSAL INFORMATION

SPILL/LEAK:

Observe all protection and safety precautions when cleaning up spills – see **Occupational Control Procedures**.

Collect spilled material and/or contaminated soil and place in metal drum or plastic-lined fiber drum and dispose of in accordance with the instructions provided under **DISPOSAL**. Thoroughly scrub floors, truck beds or other impervious surfaces with industrial detergent solution and rinse with water.

Do not contaminate water, food, or feed by storage or disposal.

DISPOSAL

Wastes resulting from the use of this product that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, state or local procedures.

STORAGE

Keep container closed to prevent spills or contamination. At the end of each use period, remove unused capsules from EZJECT™ capsule injection system. Replace unused capsules in original container and reseal.

DATE: November, 1989

SUPERSEDES: NONE

FOR ADDITIONAL NON-EMERGENCY INFORMATION, CALL: 314-694-4000

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Monsanto Company makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Monsanto Company be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

EZJECT™ is a registered trademark of Monsanto Company.

MSDSE.1

APPENDIX P

INFORMATION ON BIOLOGICAL BARRIERS



Bio[®]barrier[®]

Root Control System

Bio[®]barrier[®] is the registered trademark for Reemay, Inc.'s root control system.

Specimen Label

Precautionary Statements

CAUTION

Hazards to Humans and Domestic Animals

Keep out of reach of children.

Causes eye irritation. Harmful if swallowed, inhaled, or absorbed through the skin. Do not get in eyes, on skin, or clothing. The active ingredient trifluralin may cause skin sensitization reactions in certain individuals.

Use eye protection and protective clothing such as coveralls, a long sleeve shirt and impermeable gloves when handling this product. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

Environmental Hazards

This pesticide is toxic to fish. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark.

Physical Hazards

Do not store near heat or open flame.

(See back page for additional precautionary statements.)

Bio[®]barrier[®] is a multi-year root control system consisting of timed-release nodules impregnated with a herbicide. The nodules are attached permanently to a flexible and permeable geotextile fabric which can be contour applied to a wide variety of applications and which will inhibit plant root encroachment in the applications set forth below.

| | |
|--------------------------|---------------------------|
| Curbs | Sidewalks |
| Roads | Planting Beds* |
| Septic Fields | Tennis Courts |
| Swimming Pools | Building Foundations |
| Bike/Golf Cart Paths | Hazardous Waste Landfills |
| Utility Substations | Underground Pipes/Cables |
| Burial Vaults/Tombstones | |

*Non Food / Ornamental

ACTIVE INGREDIENTS

Trifluralin (α,α,α -trifluoro-2,6-dinitro-N,N-dipropyl-*p*-toluidine).....18.9%

INERT INGREDIENTS.....81.1%

| | |
|--------------|------------|
| EPA Reg. No. | 59823-1 |
| EPA Est. | 59823-TN-1 |

Statements of Practical Treatment

If in eyes: Flush eyes with plenty of water. Call a physician.

If swallowed: Call a physician or Poison Control Center. Drink one or two glasses of water and induce vomiting by touching the back of the throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person.

If on skin: Wash with plenty of soap and water. Get medical attention if irritation develops.

If inhaled: Remove individual to fresh air. If breathing difficulty occurs, get medical attention.

Storage and Disposal

Storage: Store in original container only. Store in dry place out of direct sunlight.

Pesticide Disposal: Do not contaminate water, food or feed by storage or disposal. Wastes resulting from the use of this product may be disposed of on-site or at an approved waste disposal facility.

Container Disposal: Completely empty container. Then dispose of wrap and/or box in a sanitary landfill or by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

Disclaimer of Warranties

The Seller makes no warranties concerning this product or its use which extend beyond the standard specifications for the products. SELLER MAKES NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER EXPRESSED OR IMPLIED WARRANTY. Buyer assumes all risk and liability resulting from the use of the products delivered hereunder, whether used singularly or in combination with other products. All statements concerning this product apply only when used as directed.

Limitation of Damages

No claim of any kind, whether as to products or for non-delivery of products, and whether or not based on negligence, shall be greater in amount than the purchase price of the products in respect to which damages are claimed. No charge or expense incident to any claims will be allowed unless approved by an authorized representative of Seller. Products shall not be returned to Seller without Seller's prior permission, and then only in manner prescribed by Seller. THE REMEDY HEREBY PROVIDED SHALL BE THE EXCLUSIVE AND SOLE REMEDY OF BUYER, AND IN NO EVENT SHALL EITHER PARTY BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER OR NOT CAUSED BY OR RESULTING FROM THE NEGLIGENCE OF SUCH PARTY.

Directions for Use: Read All Directions Carefully Before Applying.

General Directions

Biobarrier is a multi-year root control system which is strategically positioned in the soil to protect structures from plant root encroachment (see above end use sites). **Biobarrier** controls roots by establishing an in-soil barrier plane of trifluralin, which prevents root tip cell division. Roots are either stopped or redirected away from structures. Trifluralin is not systemic but can limit root mass.

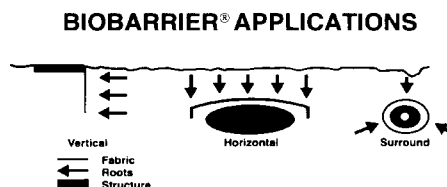
Biobarrier's multi-year feature is provided by a timed-release mechanism which continues to meter trifluralin into the soil as the exposed trifluralin biologically and chemically degrades. Structure protection is provided by placing the **Biobarrier** fabric between the root source and the structure. Since the fabric is flexible and permeable, installation may be custom contoured to obtain the most desirable root system redirection for the application and/or to accommodate obstacles.

Applications Directions

Biobarrier is ready for in-soil installation as received. The fabric should be placed in soil as soon as practical after removal from the sealed shipping container minimizing exposure to direct sunlight and elevated temperatures. Prolonged exposure can reduce the effective life of the product. Store any unused portions of the product tightly resealed in the original container in a dry place.

Biobarrier can be installed in the soil vertically, horizontally, or as a surround. Vertical applications typically require standard ditch/trench digging equipment (Follow all applicable codes when digging below surface). Vertical fabric position can be maintained by suspending it at the top with hangers. Horizontal applications may require seaming or hold down pegs. Surround applications may involve a variety of holding devices to assure fabric position. In all applications, nodules must be no further than 1-1/2 inches apart in order to assure a continuous root barrier plane. Fabric should extend a minimum of 18 inches beyond structure area to be protected as roots can grow around edges of fabric. Two inches soil overlay should also be maintained for horizontal applications. For vertical applications, the top edge must be at least 1 inch below the soil surface.

Biobarrier used in retrofit applications, where roots are already present, requires roots be interrupted with a root pruner or equivalent device. Root control will not be effective if roots penetrate fabric at time of installation.



For more information about Biobarrier®,
call 1-800-284-2780.

GREEMAY

PO Box 511

70 Old Hickory Boulevard

Old Hickory, Tennessee 37138-3651

1-800-284-2780

T91018
Rev. 5/94

Precautionary Statements

Hazards to Humans and Domestic Animals

CAUTION:

Causes eye irritation. Harmful if swallowed, inhaled, or absorbed through the skin. Do not get in eyes, on skin, or clothing. The active ingredient trifluralin may cause skin sensitization reactions in certain individuals.

Use eye protection and protective clothing such as coveralls, a long sleeve shirt, and impermeable gloves when handling this product. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

Environmental Hazards:

This pesticide is toxic to fish. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark.

Physical Hazards:

Do not store near heat or open flame.

Directions for Use:

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

STORAGE AND DISPOSAL

Storage: Store in original container only. Store in dry place out of direct sunlight.

Pesticide Disposal: Do not contaminate water, food, or feed by storage or disposal. Wastes resulting from use of this product may be disposed of on site or at an approved waste disposal facility.

Container Disposal: Completely empty container. Then dispose of wrap and/or box in a sanitary landfill or by incineration, or, if allowed by State and Local authorities, by burning. If burned, stay out of smoke.

General Directions:

Biobarrier® II is a multi-year preemergence weed control system which is strategically positioned in the soil to protect structures from plant root encroachment (see applications). Biobarrier II controls roots by establishing an in-soil barrier plane of trifluralin, which prevents root tip cell division. Roots are either stopped or redirected away from structures. Trifluralin is not systemic but can limit root mass. The multi-year feature of Biobarrier II is provided by a time-release mechanism which continues to meter trifluralin into the soil as the exposed trifluralin biologically and chemically degrades. Structure protection is provided by placing the Biobarrier II fabric between the root source and the structure. Since the fabric is flexible and permeable, installation may be custom contoured to obtain the most desirable root system redirection for the application and/or to accommodate obstacles.

Biobarrier® II

PREEMERGENCE WEED CONTROL SYSTEM

Biobarrier II is a multi-year preemergence weed control system consisting of time-release nodules impregnated with a herbicide. The nodules are attached permanently to a flexible and permeable geotextile fabric which can be contour applied to a wide variety of applications and which will inhibit plant weed encroachment in the applications set forth below.

Active Ingredient:

Trifluralin (α,α,α -trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine).. 18.9%

Inert Ingredients:..... 81.1%

TOTAL

100.0%

KEEP OUT OF REACH OF CHILDREN

CAUTION

If in eyes: Flush eyes with plenty of water. Call a physician.
If swallowed: Call a physician or Poison Control Center. Drink one or two glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person.
If on skin: Wash with plenty of soap and water. Get medical attention if irritation develops.
If inhaled: Remove individual to fresh air. If breathing difficulty occurs, get medical attention.

See Side Panel for Additional Precautionary Statements.

Mfg. by:

GREEMAY

70 Old Hickory Blvd.
P.O. Box 511

Old Hickory, TN 37138
1-800-257-6687

EPA Registration No. 59823-3
Establishment No. 59823-TN-3

Applications Directions:

Biobarrier® II is ready for in-soil installation as received. The fabric should be in soil as soon as practical after removal from the sealed shipping container minimizing exposure to direct sunlight and elevated temperatures. Prolonged exposure can reduce the effective life of the product. Store any unused portions of the product tightly resealed in the original container in a dry place.

Biobarrier II can be installed in the soil vertically, horizontally, or as a surround. Vertical applications typically require standard ditch/trench digging equipment (Follow all applicable codes when digging below surface). Vertical fabric position can be maintained by suspending it at the top with hangers. Horizontal applications may require seaming or hold down pegs. Surround applications may involve a variety of holding devices to assure fabric position. In all applications, nodules must be no further than 1-1/2 in. apart in order to assure a continuous weed control plane. Fabric should extend a minimum of 18" beyond structure area to be protected as roots can grow around edges of fabric. A minimum of 2" soil overlay should also be maintained for horizontal applications. For vertical applications, the top edge must be at least 1" below the soil surface.

Biobarrier II used in retrofit applications, where roots are already present, requires roots be interrupted with a root pruner or equivalent device. Root control will not be effective if roots penetrate fabric at time of installation.

Disclaimer of Warranties

The Seller makes no warranties concerning this product or its use which extend beyond the standard specifications for the products. **The Seller makes no warranties of merchantability or fitness for a particular purpose, or any other express or implied warranty.**

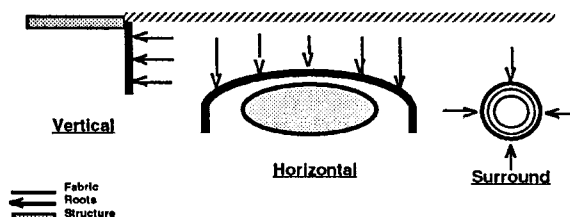
Buyer assumes all risk and liability resulting from use of the products delivered hereunder, whether used singularly or in combination with other products. All statements concerning this product apply only when used as directed.

Limitation of Damages

No claim of any kind, whether as to products delivered or for nondelivery of products, and whether or not based on negligence, shall be greater in amount than the purchase price of the products in respect to which damages are claimed. No charge or expense incident to any claims will be allowed unless approved by an authorized representative of Seller. Products shall not be returned to seller without Seller's prior permission, and then only in a manner prescribed by Seller. **The remedy hereby provided shall be the exclusive and sole remedy of Buyer, and in no event shall either party be liable for special, indirect or consequential damages, whether or not caused by or resulting from the negligence of such party.**

Biobarrier II Applications*

| | |
|--------------------------|---------------------------|
| Curbs | Sidewalks |
| Roads | Planting Beds |
| Septic Fields | Tennis Courts |
| Swimming Pools | Building Foundations |
| Bike/Golf Cart Paths | Hazardous Waste Landfills |
| Utility Substations | Underground Pipes/Cables |
| Burial Vaults/Tombstones | |



*Non Food / Ornamentals

Topic: _____

Technical Data

| | |
|---|---|
| Product | Tex-R Industrial |
| Registration number | 24268 |
| Color | grey/black (copper-coated side) |
| Fiber | Polyester and/or polypropylene |
| Mass per unit (g/m²) * Weight | 195g/m ² ±15g (mat. + CU) |
| Thickness (mm) ASTM D5199-91 CGSB 148.1-3 | 0,9 ± 0,1mm |
| Tensile Strength * ASTM D4632-91 GCSB 148.1-7.3 | 550 N (minimum) |
| Elongation at break * ASTM D4632-91 CGSB no.10M87 | 40 - 70 % |
| Tear Propagation * ASTM D4533-91 CGSB 148.1 1-7.3 | 185 N (minimum) |
| Bursting Mullen* ASTM D-3786-87 CGSB 2-4.2-M-77-11.1 | 1800 kPa |
| Filtration Opening Size (microns) FOS CGSB 148.1-10 | < 70µ |
| Air Permeability * CFM | 3 -1 -2 10,8m min m |
| Construction | Needlepunched, Copper-coated nonwoven |
| Root Growth Regulator Coating | Copper hydroxide-Cu(OH) 2 |
| Mechanical Resistance | An estimate of 25 years and more to maintain a minimum of 75% of its mechanical properties if used according to installation specifications. |
| Chemical resistance | An estimate durability of 15 years and over related to a weed control efficiency of more than 90% (re: Study by Gilles Leroux of Laval University) |
| Sizes Available | 1,22m X 100m and 1,83m X 100m |

* These values represent a 95 percent confidence level.

We believe that the above specifications are exact but they should not be considered as absolute. Texel Inc. does not offer any guaranty for Texel has no control over the use, the installation and/or the proper use of the agrotexile described in this document. Texel Inc. must be informed of any defective or non-conform product before installation. Texel's reponsibility limits itself to replacing the non-conform or defective product. Texel Inc. reserves the right to modify these properties in relation to the knowledge and technical evolution of the product. Furthermore, any user must verify if this technical data sheet represents the last issue.

02-11-98
REF-00179

MARCO LEHOUX

MATERIAL SAFETY DATA SHEET

MANUFACTURER'S /SUPPLIER'S:

NAME AND ADDRESS

TEXEL INC.
485 Des Erables
Elzéar-de-Beauce
Québec, Canada
G0S 2J0

EMERGENCY TELEPHONE NUMBER:

(418) 387-5910

SECTION 1 - MATERIAL IDENTIFICATION AND USE

MATERIAL NAME: Polypropylene
CHEMICAL NAME: Olefin polymer
C.A.S. NUMBER: 9003-07-0
MATERIAL USE: Nonwoven fabrics

SECTION 2 - HAZARDOUS INGREDIENTS

Not considered hazardous by the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200) (U.S.A.).

SECTION 3 - PHYSICAL DATA

APPEARANCE AND ODOR: White staple fiber; odorless.
ODOR THRESHOLD: N/A
SPECIFIC GRAVITY (water=1): 0.9
SOLUBILITY IN WATER (20°C): Negligible, below 0.1%.

SECTION 4 - FIRE AND EXPLOSION DATA

FLAMMABILITY: Good flame resistance.

EXTINGUISHING MEDIA: Agents approved for Class A hazards (e.g. halogenated agents, foam, steam) or water fog.

SPECIAL PROCEDURES: Fire fighters and personnel should protect themselves from smoke inhalation, decomposition and combustion products.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None under normal conditions of use.

FLASHPOINT: 690°F (365°C)

HAZARDOUS COMBUSTION PRODUCTS: May include carbon, hydrogen and oxygen. The exact composition will depend on the conditions of combustion.

SECTION 5 - REACTIVITY DATA

STABILITY: Stable; softens at 285°-330°F (141°-166°C), melts at about 320°-350°F (160°-176°C), decomposes at 550°F (288°C).

COMPATIBILITY WITH OTHER SUBSTANCES: Attacked by nitric and chlorosulphonic acids, sodium and potassium hydroxide at high temperatures and concentrations.

REACTIVITY: Excellent resistance to organic and mineral acids, solvents and alkalis.

HAZARDOUS DECOMPOSITION PRODUCTS: Incomplete burning can produce carbon monoxide, carbon dioxide and other harmful products.

SECTION 6 - TOXICOLOGICAL PROPERTIES

EFFECTS OF OVER EXPOSURE: None in our experience under normal conditions of handling and use.

CARCINOGENICITY: No component of this product is identified as a carcinogen by NTP, IARC or OSHA.

IRRITANCY OF MATERIAL: No significant irritation expected other than possible mechanical irritation.

SECTION 7 - PREVENTIVE MEASURES

WASTE DISPOSAL METHOD: Disposal must be in accordance with applicable federal , state or local regulations.

STORAGE REQUIREMENTS: No special requirements.

SPECIAL SHIPPING INFORMATION:
Not classified as hazardous materials for transportation purposes.

LABEL INFORMATION: Does not require any hazard warning label under the OSHA Hazard Communication Standard.

SECTION 8 - PROTECTION MEASURES

REPIRATORY PROTECTION: If dust is generated and ventilation is inadequate, use NIOSH/MSHA certified respirator which will protect against dust.

VENTILATION: Ventilation is recommended to minimize exposure to finish mists.

PROTECTIVE GLOVES: None required.

EYE PROTECTION: None required; however, use of safety glasses is good industrial pratice.

OTHER PROTECTIVE EQUIPMENT:

None required.

SECTION 9 - FIRST AID MEASURES

EYES: In case of irritation, flush eyes with plenty of water. Get medical attention if irritation persists.

SKIN: In case of irritation, flush exposed skin with plenty of water.

INHALATION: None required.

INGESTION: None required.

SECTION 10 - PREPARATION DATE OF THE MSDS

PREPARED BY: Research and Development Department.
Edith Rodrigue, Short term projects coordinator.

APPROVED BY: Quality Control Department.

Réjean Berthiaume, Quality Control Supervisor

PHONE NUMBER: (418) 387-5910 ISSUED: October, 1998

This material safety data sheet and the information herein is accurate to the best of our knowledge and belief. We have reviewed any information contained in this data sheet which we received from sources outside our company. We believe that information to be correct but cannot guarantee its accuracy or completeness. Although certain hazards may be described herein, we cannot guarantee that these may be the only hazards which exist. Final determination of suitability of any material and whether there is any infringement of patents is the sole responsibility of the user. Since the material may be used under conditions beyond those which are reasonable foreseeable and/or beyond our control, we assume no responsibility for its use.

APPENDIX Q
HERBICIDE MANUFACTURER CONTACTS
(Current as of September 1999)

APPENDIX Q
Herbicide Manufacturer Contacts

| <u>Manufacturer</u> | <u>Phone</u> | <u>Internet</u> |
|-----------------------------------|----------------------------------|---|
| American Cyanamid | 1-800-545-9525 | http://www.cyanamid.com |
| Dow Elanco (Dow Agro Sciences) | 1-800-258-3033 1-800-263-1196 | http://www.dowagro.com/ivm |
| DuPont | 1-888-638-7668 | http://www.dupont.com |
| Monsanto | 1-800-332-3111 | http://www.monsanto.com |
| PBI/Gordon | 1-800-236-5411 | http://www.pbigordon.com |

APPENDIX R

NATURAL RESOURCE CONSERVATION SERVICE (NRCS) CONTACTS

(Current as of September 1999)

APPENDIX R
NATURAL RESOURCE CONSERVATION SERVICE (NRCS) CONTACTS

| <u>State</u> | <u>Phone</u> | <u>Internet*</u> |
|--------------|--------------|---|
| Arizona | 602-280-8801 | http://www.az.nrcs.usda.gov/ |
| California | 530-792-5600 | http://www.ca.nrcs.usda.gov/ |
| Colorado | 303-236-2910 | http://www.co.nrcs.usda.gov/ |
| Iowa | 515-284-4260 | http://www.ia.nrcs.usda.gov/ |
| Kansas | 785-823-4500 | http://www.ks.nrcs.usda.gov/ |
| Minnesota | 651-602-7900 | http://www.mn.nrcs.usda.gov/ |
| Montana | 406-587-6868 | http://www.mt.nrcs.usda.gov/ |
| Nebraska | 402-437-5300 | http://www.ne.nrcs.usda.gov/ |
| Nevada | 702-784-5863 | http://www.nv.nrcs.usda.gov/ |
| New Mexico | 505-761-4401 | http://www.nm.nrcs.usda.gov/ |
| North Dakota | 701-250-4421 | http://www.nd.nrcs.usda.gov/ |
| South Dakota | 605-352-1200 | http://www.sd.nrcs.usda.gov/ |
| Texas | 254-742-9800 | http://www.tx.nrcs.usda.gov/ |
| Utah | 801-524-4550 | http://www.ut.nrcs.usda.gov/ |
| Wyoming | 307-261-6453 | http://www.wy.nrcs.usda.gov/ |

* Can sometimes get local office information from State home pages listed above. Usually all states will have phone number for State Conservationist and local Soil Conservationists, who can be very helpful with revegetation, seed mixes, etc. USDA NRCS (Federal) home page is <http://www.nrcs.usda.gov/>. Phone numbers may change frequently.

APPENDIX S
STATE COOPERATIVE EXTENSION CONTACTS
(Current as of September 1999)

APPENDIX S

STATE COOPERATIVE EXTENSION CONTACTS

| <u>State</u> | <u>Coop. Ext. University</u> | <u>Phone</u> | <u>Internet*</u> (address for local office information) |
|--------------|--|---|--|
| Arizona | University of Arizona Tuscon, AZ | 520-621-7205 | http://ag.arizona.edu/extension/personnel/countymap.html |
| California | University of California, Davis Oakland, CA | 510-987-0505 or 530-752-7091 (weed info) | http://www.ucdavis.edu/outreach.html (cannot access local extension office information online. Can get this list in the catalog that is available). |
| Colorado | Colorado State University Fort Collins, CO | 970-491-6281 | http://www.colostate.edu/Depts/CoopExt/COOP/ctylist.html |
| Iowa | Iowa State University Ames, IA | 515-294-6192 | http://www.exnet.iastate.edu/Counties/state.html |
| Kansas | Kansas State University Manhattan, KS | 785-532-5790 | http://www.oznet.ksu.edu/site2/kces/co-ofcs.htm |
| Minnesota | University of Minnesota St. Paul, MN | 612-625-1915 | http://www.mes.umn.edu/Outstate/ |
| Montana | Montana State University Bozeman, MT | 406-994-6648 | http://extn.msu.montana.edu/about_us/counties/counites.htr |
| Nebraska | University of Nebraska Lincoln, NE | 402-472-2966 | http://www.ianr.unl.edu/counties.html |
| Nevada | University of Nevada-Reno Reno, NV | 702-251-7531 | http://www.nce.unr.edu/extension/AreaSites.html |
| New Mexico | New Mexico State University Las Cruces, NM | 505-646-3015 | http://www.cahe.nmsu.edu/CAHE/ces/directory.html |
| North Dakota | North Dakota State University Fargo, ND | 701-231-8944 | http://www.ag.ndsu.nodak.edu/clyweb.htm or www.ext.nodak.edu |
| South Dakota | South Dakota State University Brookings, SD | 605-688-4147 | http://www.abs.sdstate.edu/county/ |
| Texas | Texas A&M University College Station, TX | 409-845-7800 | http://agextension.tamu.edu/ (go to county offices) |
| Utah | Utah State University Logan, UT | 801-627-3270 | http://www.ext.usu.edu/regions/index.htm |
| Wyoming | University of Wyoming Laramie, WY | 307-766-5124 | http://www.uwyo.edu/ag/ces/ext3.htm |

- * The address shown is generally the one that will take you directly to local extension office information. If you should have trouble reaching this, drop the last portion of the address and go back to the “edu”, and then look for entries such as “Extension”, “Outreach”, “Services”, “Administration”, “Departments”, or an agricultural department listing. Phone numbers and Internet address may change frequently.

APPENDIX T

EXAMPLE TREE REPLACEMENT AGREEMENT

BACKGROUND SITUATION WITH RESPECT TO TREES AND WESTERN AREA POWER ADMINISTRATION TRANSMISSION LINES

Throughout the power transmission system of the Western Area Power Administration (Western), there are scattered locations where transmission lines and tall trees (in farmstead and field windbreaks) come in conflict with one another. In order to maintain the integrity of the transmission lines and reduce maintenance costs, Western proposes to remove existing tall trees within and/or adjacent to its transmission line right-of-way. In order to maintain windbreak effectiveness, and to replace wildlife habitat, lower profile shrubs would then be planted (or trees may be planted outside the easement). It is the hope of Western that they can act as liaison between the landowner and the local conservation district to remove the offending trees and provide suitable alternative shrubs. This agreement outlines the responsibilities of all parties involved.

To assist in planning, the following shrubs would be appropriate for this purpose.

Buffaloberry, silver

Buffaloberry, 'Sakakawea' silver

Cherry, 'Mongolian'

Cherry, Nanking

Cherry, Western sand

Cotoneaster, Peking

Cotoneaster, intergerrima

Currant, golden

Dogwood, redosier

Honeysuckle, tatarian

Lilac, common

Lilac, late

Peashrub, Siberian (Caragana)

Plum, native

Rose, Woods

Rose, Hansen hedge

Serviceberry, Saskatoon (Juneberry)

Sumac, skunkbush

TREE REPLACEMENT AGREEMENT

The following entities enter into this agreement to remove tall trees within and/or adjacent to the right-of-way of Western Area Power Administration transmission line(s) and to subsequently provide replacement shrubs to maintain windbreak effectiveness and provide wildlife habitat.

**Western Area Power Administration
Bismarck District Office
P.O. Box 1173
Bismarck, ND 58502-1173**

Stutsman County **(Soil Conservation District)**
1301 Business Loop East
Jamestown, ND 58401-5946

Joe Landowner **(Landowner/operator)**
(address)

Jane Landowner **(Landowner/operator)**
(address)

John Landowner **(Landowner/operator)**
(address)

WHAT WESTERN AREA POWER ADMINISTRATION (WESTERN) WILL DO:

1. Contact landowner/operator to reach a basic understanding pertaining to the removal of tall trees within and/or adjacent to the transmission line right-of-way and subsequent planting of low profile shrubs.
2. Notify local Soil Conservation District of:
 - sites within their district before tree removal
 - landowner/operator name(s)
 - landowner/operator address(es)
 - landowner/operator phone number(s)
 - best times to contact landowner/operator
 - legal description of property
 - site location (photo or detailed sketch)
 - projected planting time
 - number of tree rows and length of tree rows to be replaced
3. Remove all trees from within the right-of-way and chemically treat them to prevent regrowth. Trees will be removed and chipped up using a chipping machine.
4. Reimburse landowner/operator for any damages to crops, buildings, fences or livestock incurred that were a direct result of Western actions during tree and stump removal operations. Reimburse landowner/operator for any damages to crops that were a direct result of the Soil Conservation District actions during the planting or follow-up inspection activities.
5. Generate the necessary procurement documents and pay the Soil Conservation District according to applicable Federal Acquisition Regulations. If a fiscal year changes (the fiscal year starts October 1) during the period this agreement is in effect, then Western's obligation for performance of this agreement in the new fiscal year is contingent upon the availability of appropriated funds. All parties will be promptly notified if it becomes apparent that funds will not be available. Payment is normally issued within 45 days after receipt of an itemized bill.

WHAT THE SOIL CONSERVATION DISTRICT (DISTRICT) WILL DO:

1. Develop windbreak or tree planting plan with landowner/operator and select a species from the approved species list that are adapted to the site(s) and the climate. Coordinate with the landowner/operator to minimize crop damage during the planting and follow-up inspection activities.
2. Plant site(s) according to appropriate District standards and specifications, and as shown on the attached drawing.
3. **This condition deleted.**
4. **This condition deleted.**
5. During the spring of the year following planting, revisit the site and replant any shrubs/trees that have died. Send to Western a letter identifying the site, the number of surviving shrubs/trees and the number of shrubs/trees replanted. This cost shall not exceed \$70, based on an estimated loss of 10% at \$0.90/shrub.
6. After the initial planting, provide an itemized bill to Western Area Power Administration showing:
 - landowner/operator name
 - landowner/operator address
 - legal description of site (to nearest 1/4 section)
 - date planted
 - linear feet of shrub row planted
 - number and type of shrubs planted
 - total dollar amount of shrub planting
7. Provide weed badgering services three times per year (May-Sept), for the first-fourth year (three times per year for four years). The cost of weed badgering shall not exceed \$35/hour x 3 hours per year, \$105/year, or \$420 total.

8. Provide items 1-6 above at a rate not to exceed \$392 (\$14.00 per 100 linear feet of shrub row planted). The above rate excludes \$25 for initial tree planting, \$420 for weed badgering, and \$70 for replanting new shrubs the following spring.

WHAT THE LANDOWNER/OPERATOR WILL DO:

1. Work with Western and the District to determine the best time for activities to occur and best access routes to site(s).
2. Work with District to develop planting plan.
3. *This condition deleted*.
4. Prevent livestock from grazing new planting.
5. Follow guidance on herbicide labels and prevent chemical drift on new plants.
6. Continue to perform weed control until windbreak is fully established.

SITE SPECIFIC DETAILS:

The site(s) needing tree replacement is (are) located in the w1/2, Section 21, T140N, R64 W, of Midway Township, in Stutsman County, North Dakota.

Specific site locations on the property are indicated on the attached photo or sketch, which is part of this agreement.

There is/are 2 tree rows totaling 2,800 lineal feet in length that will be planted. Common Lilac and Buffaloberry shrubs shall be planted in accordance with the attached drawing.

Initial shrub planting will be completed by June 1, 1997. *Note a portion of this clause was deleted because Landowners agreed to leaving tree stumps and chemically treating them to prevent regrowth.****

Follow-up inspection and replacement planting will be completed by June 1, 1998.

SIGNATURES

Western Area Power Admin.

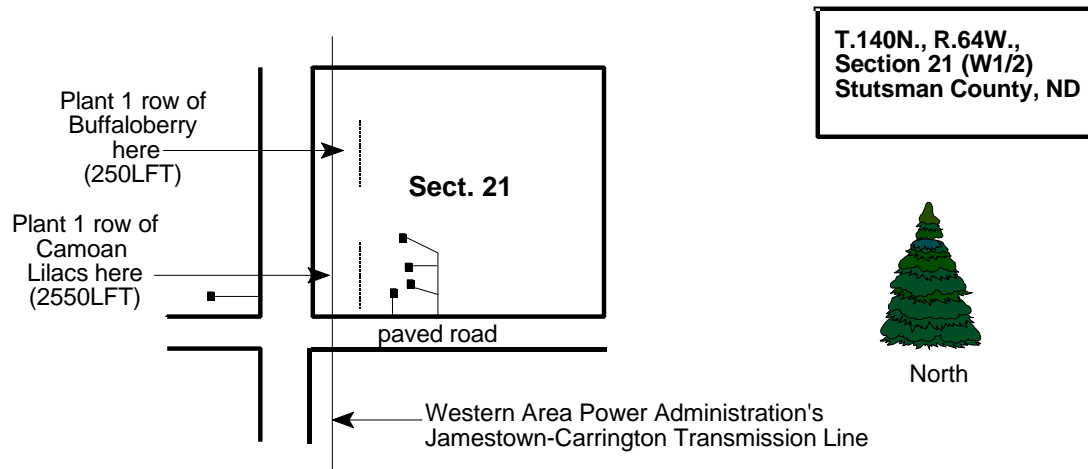
Chairman
Stutsman Cty. Soil Conservation District

LANDOWNERS:

Joe Landowner

Jane Landowner

John Landowner



**Tree Planting Agreement between Western Area Power Administration,
Landowners, and the Stutsman County Soil Conservation District.**

Jan. '97